

NBS-GCR-80-297

**The Determination of Behavior
Response Patterns in Fire
Situations, Project People II.
Final Report - Incident Reports,
August 1977 to June 1980**

J. L. Bryan, P. J. DiNenno, and
J. A. Milke

December 1980

Sponsored by
**U.S. Department of Commerce
National Bureau of Standards
Washington, DC 20234**

and

**U.S. Department of Health and Human Services
Washington, DC 20201**

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J. L. Bryan, P. J. DiNenno, and
J. A. Milke

University of Maryland
Fire Protection Curriculum
College Park, MD 20742

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NBS Grant 7-9014

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THE DETERMINATION OF BEHAVIOR RESPONSE PATTERNS
IN FIRE SITUATIONS, PROJECT PEOPLE II.
FINAL REPORT - INCIDENT REPORTS
AUGUST, 1977 TO JUNE, 1980
PART 1

by

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August 31, 1980

Department of Fire Protection Engineering
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Notice

This report was prepared for the Center for Fire Research of the National Engineering Laboratory, National Bureau of Standards under Grant No. 7-9014. The statements and conclusions contained in this report are those of the authors and do not necessarily reflect the views of the National Bureau of Standards or the Center for Fire Research.

PREFACE

This report is a product of a joint effort of the Department of Health and Human Services (HHS) and the National Bureau of Standards (NBS) Center for Fire Research. The program is a continuation of an activity initiated in 1975. It consists of projects in the areas of: decision analysis, fire and smoke detection, smoke movement and control, automatic extinguishment, and behavior of institutional and other populations in fire situations.

These studies were conducted under Grant 7-9014, from the Center for Fire Research at the National Bureau of Standards. The research grant is titled: "The Determination of Behavior Response Patterns in Fire Situations, Project People II."

This report summarizes a series of studies of behavioral patterns of building occupants in 65 fire incidents occurring between August 10, 1977 and June 25, 1980. A technique called "mapping" developed by Lars Larup of the University of California at Berkeley was used for purposes of analysis for each of these incidents.

The objective of the project study was to relate behavior in fire emergencies to previous training, to the degree of exhibited stress, to the fire protection features of the structure, and to the nature of the fire emergency.

An understanding of such relationships is of value in the development of effective fire safety plans for a variety of institutional and other buildings and in the choice of appropriate facility design and fire safety hardware.

ACKNOWLEDGMENTS

The fire incident reports summarized in this interim report would not have been included in the research study without the complete cooperation of the facility administrators, staff personnel, and in many incidents, the patients.

The assistance and cooperation of fire service personnel in the participating governmental jurisdictions has been most valuable and in particular the following officials: Commissioner Joseph R. Rizzo, Deputy Fire Marshal James Meskill, and Lt. Joseph H. O'Drain, Philadelphia, Pa.; Fire Marshal James F. Dalton, Deputy Fire Marshal Dennis McLaughton, and Sargeant Paul W. Mindte, Montgomery County, Md.; Chief Paul H. Reincke and Battalion Chief E. M. Markowitz, Baltimore County, Md.; Chief M. H. Estepp, Deputy Chief R. J. Nieves and Mrs. Nancy Landes, Prince George's County, Md.; Chief Harry W. Klasmair and Fire Marshal Bruce Hisley, Anne Arundel County, Md.; Chief Hunter P. Heltzel, Silver Spring Volunteer Fire Department, Chief Charles E. Steele, City of Annapolis, Md.; Harrison B. Shipley, Jr. Fire Administrator and Captain W. R. Faith, Howard County, Md.; Chief Thomas J. Burke, and Battalion Chief Frank Little, Baltimore City; Chief Fred C. Bagley, Kensington Volunteer Fire Department; Chief Frank L. Leizear, Bethesda Fire Department; Chief Jefferson Lewis, Asst. Chief John P. Devine and Fire Marshal C. S. De Balzo, District of Columbia; and James C. Robertson, State Fire Marshal, State of Maryland.

The diagrams in the fire incident reports were prepared by Elizabeth P. Noyes, Kathy Bennett, Connie Tabler, Shea Leifer, James Tallman and James Milke. The preparation of the fire incident reports were due to the efforts of

Mrs. Donna Fitzpatrick, Mrs. Eloise McBrier, Mrs. Jeanne Fahrner, Miss Mae Reavis, Miss Barbara Deyton and Miss Cindy Baumann. This final report was prepared by Mrs. Jeanne Fahrner and Miss Cindy Baumann.

The narrative accounts of the incident reports included in this interim report were prepared by John L. Bryar and Philip J. DiNunno or James A. Milke. The interviewing of fire incident participants has been conducted by John L. Bryan, Philip J. DiNunno, James A. Milke, William Rigby, Cal Staubus and Jeanne Fahrner.

Table of Contents

	Page
INTRODUCTION	1
INCIDENT CHARACTERISTICS	4
1. Facilities	4
2. Behavioral Actions	7
3. Fire Protection	19
FIRE INCIDENT SUMMARIES	13
1. St. Joseph's Hospital	13
2. Kensington Gardens Nursing Home	18
3. Manor Care, Hyattsville Nursing Home	22
4. Manor Care, Adelphi Nursing Home	25
5. Manor Care, Adelphi Nursing Home	28
6. Harford Memorial Hospital	31
7. Sacred Heart Home	34
8. Magnolia Gardens Nursing Home	37
9. University of Maryland Hospital	40
10. Anne Arundel General Hospital	41
11. Lorien Nursing Home	43
12. Manor Care, Largo Nursing Home	45
13. American Nursing Home and Convalescent Center	47
14. Anne Arundel General Hospital	50
15. Allegany County Infirmary	52
16. Sligo Gardens Nursing Home	55
17. Avalon Manor Convalescent Center	58
18. St. Anne's Infant Home	61

	Page
19. Maryland General Hospital	63
20. Manor Care, Largo Nursing Home	65
21. North Arundel Hospital	68
22. Manor Care, Towson Nursing Home	71
23. Lafayette Square Nursing Center	73
24. Sheppard Pratt Hospital	76
25. Anne Arundel General Hospital	79
26. Washington Adventist Hospital	81
27. Spring Grove Hospital Center	83
28. Washington Adventist Hospital	85
29. Southern Maryland Hospital Center	88
30. Georgian Towers Apartments	91
31. Crownsville Hospital Center	94
32. University of Maryland Hospital	97
33. Sheppard Pratt Hospital	100
34. Pikesville Nursing and Convalescent Center	102
35. Ellicott City Middle School	105
36. Hidden Brook Treatment Center	108
37. Montgomery General Hospital	111
38. University of Maryland Hospital	113
39. Sheppard Pratt Hospital	115
40. Taylor House.....	118
41. University Nursing Home.....	122
42. Kensington Gardens Nursing Home.....	125
43. Thurston Hall Dormitory.....	127

	Page
44. National Institutes of Health Clinical Center	131
45. Roosevelt Hotel	135
46. Mt. Wilson Hospital Center	138
47. Bethesda Health Center	142
48. Franklin Square Hospital	146
49. Maryland Masonic Home	150
50. Sheppard Pratt Hospital	154
51. Reeder's Memorial Nursing Home	157
52. Union Hospital of Cecil County	160
53. Crownsville Hospital Center	163
54. Mt. Wilson Hospital Center	167
55. Thomas B. Finan Center	171
56. Peninsula General Hospital	175
57. Crownsville Hospital Center	179
58. Crownsville Hospital Center	184
59. Gunston School	188
60. Sheppard Pratt Hospital	192
61. Fallston General Hospital	195
62. Chesapeake Hall Dormitory	199
63. Washington Adventist Hospital	204
64. Patuxent Institute Diagnostic Center	208
65. Wilson Health Center	212
BIBLIOGRAPHY	218
APPENDIX	220
ADDENDUM	224

INTRODUCTION

This report is a summary and initial analysis of the sixty-five fire incidents included in the study population of Project People II.* The fire incidents have been analyzed to present the descriptive characteristics of the facilities with the construction, interior finish, and fire zone features in Table 1. The staff and fire department behavioral actions were summarized and are presented in Table 2 with the number of persons evacuated, the means of evacuation, the extinguishment behavior, the closing of doors and the ventilation of smoke through the facility windows. The fire protection features of the facilities are presented in Table 3.

The sixty-five fire incidents included in this summary occurred between August 10, 1977 and June 25, 1980. The facilities involved in the incidents have primarily been health care facilities in accordance with the objectives of the research study with twenty-five nursing homes or convalescent centers and thirty-three hospitals. In addition, two schools, two high rise apartments, two university dormitories and one correctional institution fire incidents were included due to the extensive evacuation behavior.

The facilities have all been located within the State of Maryland, with the exception of one fire incident in Philadelphia and three fire incidents in Washington, D.C.

The abstract of each fire incident report is presented with the diagrams of the maximum fire and smoke development in the realms and the movements of personnel in the behavioral episodes. The individual fire incidents were studied with a survey of the facility and interviews with critical fire department, staff and patient personnel.

*Individual reports on each of the incidents may be obtained from the National Technical Information Service. For a listing of these reports, with ordering information, see the addendum of this report on pp. 224-225.

The study procedure utilized an open ended, individual interview technique with one study project member interviewing one occupant in a private situation.

A structured questionnaire was also utilized in the study to facilitate the collection of comparable data to the various fire incidents and the previous study conducted for the Center for Fire Research.⁽²⁾ The questionnaire was administered to the participant individually at the beginning of the study following the unstructured recorded interview. The questionnaires developed for use in this research study are included as an appendix. The recorded interviews were transcribed by staff personnel immediately following the conduct of the interviews. The concepts of the fire realms with critical events have been adapted for this study following the procedures from Lerup. Lerup has defined a fire realm and critical event in the following manner:¹

A realm is defined as an internally consistent state or condition of fire behavior within a time period, e.g., fire spreading within a room. The beginning and end of such a realm is marked by a critical event, a pivotal point that changes the development of the fire, e.g., the same fire's entering an adjacent room.

In addition, the movement and actions of critical personnel are described by Lerup with the conceptual term of episodes, coinciding with the temporal pattern of the staff, patients, and fire department personnel movement. Lerup has defined the concept of an episode as follows:²

Human behavior during a fire can be ascribed in a manner analogous to the physical events in a fire. Any individual is involved in a continuous stream of behavior, but this stream has discrete units called episodes, defined at start and end by decision points. An episode, for example could be a nurse rescuing patients, defined

¹Lerup, Lars, People in Fires: A Manual for Mapping. Washington, D.C.: Center for Fire Research, National Bureau of Standards, NBS-GCR-77-106, 1977, p. 23.

²Op. Cit., Lerup, p. 29.

at finish by decision point "decision to stop rescue because of smoke density".

The conclusions of each fire incident report are also included, and in those reports where developed, the formulation of hypotheses from the fire incident.

The Selected Bibliography for this summary report includes the references utilized for the sixty-five incident reports. The summaries of the fire incident reports are presented in chronological order relative to the date of the fire incident.

Table 1. FACILITIES

Facility	Incident Date	Hospital		Occupancy		# of Patients/ Occupants	# of Staff	Construction		Interior		Fire Zone	
		Gen'l	Mental	Nursing Home	Other			Type	Height (Floors)	Ceiling & Wall	Floor	Corridor	Patient Rm.
1. St. Joseph's Hospital	8/10/77	X				(32)171	51	ORD	4	A	B	20	20
2. Kensington Gardens	1/1/78			X		(7)170	(3)44	PNC	2	A	A	60	45
3. Manor Care, Hyattsville	1/10/78			X		(10)26	(2)10	FR	2	A	A	60	45
4. Manor Care, Adelphi	3/1/78			X		185	26	FR	2	A	A	60	45
5. Manor Care, Adelphi	3/1/78			X		(30)185	(2)26	FR	2	A	A	60	45
6. Barford Memorial	3/9/78	X				(42) 279	(4)	FR	6	A	A	60	20
7. Sacred Heart	3/19/78			X		(20)101	(4)33	PNC	4	A	A	60	45
8. Magnolia Gardens	4/2/78	X		X		(50)102	(5)10	PNC	2	A	A	60	20
9A. Univ. of MD Hospital	4/26/78	X				864		FR	15	A	A	60	45
9B. Univ. of MD Hospital	4/27/78	X				864		FR	15	A	A	60	45
9C. Univ. of MD Hospital	4/27/78	X				864		FR	15	A	A	60	45
9D. Univ. of MD Hospital	4/27/78	X				864		FR	15	A	A	60	45
9E. Univ. of MD Hospital	4/28/78	X				864		FR	15	A	A	60	45
9F. Univ. of MD Hospital	4/28/78	X				864		FR	15	A	A	60	45
9G. Univ. of MD Hospital	5/1/78	X				864		FR	15	A	A	60	45
9H. Univ. of MD Hospital	5/5/78	X				864		FR	15	A	A	60	45
9I. Univ. of MD Hospital	5/6/78	X				864		FR	15	A	A	60	45
9J. Univ. of MD Hospital	5/7/78	X				864		FR	15	A	A	60	45
9K. Univ. of MD Hospital	5/8/78	X				864		FR	15	A	A	60	45
10. Anne Arundel General	5/1/78	X				(42) 277	(5)	FR	8	A	A	60	45
11. Lorton	5/7/78			X		(20) 50	(4) 9	FR	3	A	A	60	20
12. Manor Care, Largo	5/9/78			X		100	15	FR	2	A	A	60	45
13. American	5/11/78			X		(50) 265	9	FR	3+B	A	A	60	45
14. Anne Arundel General	5/11/78			X		(42) 279	4	FR	6	A	A	60	45
15. Allegany County	5/16/78	X				(30)71	(2) 4	FR	2+B	A	A	60	20
16. Sligo Gardens	6/10/78			X		(50) 100	(7)14	FR	2	A	A	60	45
17. Avalon Manor	6/16/78			X		(11)115	(5)10	FR	2	A	A	60	20
18. St. Anne's	6/20/78				X	133	20	FR	4+B	A	A	60	45
19. Maryland General	8/8/78	X				(18)450	(12)	FR	7	A	A	60	45
20. Manor Care, Largo	8/14/78	X		X		108	18	FR	2	A	A	60	45
21. North Arundel	9/4/78			X		(25) 285	(8)	FR	7+B	A	A	60	45
22. Manor Care, Towson	10/18/78			X		(47) 109	(3)	FR	2	A	A	60	45
23. Lafayette Square	10/24/78			X		262	135	P.ORD	5	A	A	60	45
24A. Sheppard Pratt	10/25/78		X			(1) 301		FR	4	A	B	60	45
24B. Sheppard Pratt	10/26/78		X			(2) 301		FR	4	A	B	60	45
25. Anne Arundel General	11/14/78	X				(42) 277	(4)	FR	8	A	A	60	45
26. Washington Adventist	12/9/78	X				360	87	FR	5+2B	A	A	60	20

Table I. (Cont'd.)

Facility	Incident Date	Occupancy		Other	# of Patients/Occupants	# of Staff	Construction		Interior Ceiling & Wall	Finish Floor	Fire Zone	
		Hospital Gen'l	Nursing Home				Type	Height (Floors)			Corridor	Patient Room Door
27. Spring Grove	12/14/78		X		(30) 20	(3) 12	FR	J	A	A	60	20
28. Washington Adventist	12/22/78	X			(32) 360	(9) 87	FR	6+2B	A	A	60	20
29. Southern Maryland	1/2/79	X			(17) 300	(2)	FR	5	A	A	60	45
30. Georgian Towers	1/9/79			X	494	2	FR	15	A	A	60	45
31. Crownsville	1/26/79		X		(25) 100	(3) 12	FR	1	A	A	0	0
32. University of MD	2/6/79	X			(10) 864	(5)	FR	15	A	A	60	45
33. Sheppard Pratt	2/7/79		X		301		FR	3+B	A	A	60	45
34. Pikesville	2/8/79			X	159	49	NC	2+B	A	A	60	45
35. Ellicott City	2/14/79			X	520	51	ORD	1+B	A	A	60	0
36. Hidden Brook	2/15/79			X	35	3	P,ORD	3	A	A	60	20
37. Montgomery General	3/28/79	X			(8) 129	(2)	PNC	7	A	A	60	45
38. University of MD	4/4/79	X			(10) 864	(4)	FR	12	A	A	60	45
39. Sheppard Pratt	4/5/79				(20)	(3)	FR	3+B	A	A	60	45
40. Taylor House	4/11/79			X	51	2	ORD, WF	3+B	A	C	30	0
41. University	4/13/79		X		(22) 135	(3) 32	FR	2	A	A	60	45
42. Kensington Gardens	4/14/79		X		(12) 170	(2) 14	FR	2	A	A	60	45
43. Thurston Hall	4/19/79			X	898	4	FR	9	A	A	60	20
44. NIH	4/21/79			X	(8) 234	(3) 200	FR	14+B	A	A	60	45
45. Roosevelt Hotel	4/24/79			X	430	-	FR	8	A	B	60	0
46. Mt. Wilson	6/10/79			X	(26) 51	(2) 4	P,ORD	2+B	A	A	60	20
47. Bethesda Health Ctr.	6/12/79			X	172	15	P,ORD	2	A	A	60	20
48. Franklin Square	6/13/79			X	(31) 250	(8)	FR	3	A	A	60	20
49. MD Plasonic Home	6/21/79			X	100	40	FR	4+B	A	A	60	45
50. Sheppard Pratt	6/24/79		X		301		FR	4	A	A	60	45
51. Reeder's Memorial	7/29/79		X		101	14	FR	2	A	A	60	20
52. Union Hospital	7/29/79			X	150	80	FR	6	A	A	60	20
53. Crownsville	8/19/79			X	(9) 150	10	FR	1	A	A	0	0
54. Mt. Wilson	9/4/79		X		(32) 300	(6)	FR	8	A	A	60	20
55. Panan Center	9/9/79		X		(20) 50	(3)	NC	1	A	A	60	20
56. Peninsula General	9/22/79		X		(8) 340	(8)	FR	5+B	A	A	60	20
57A. Crownsville	10/5/79		X		(25) 150	(5) 30	FR	J	A	A	0	0
57B. Crownsville	10/12/79		X		(25) 150	(4) 30	FR	1	A	A	0	0
58. Crownsville	10/12/79		X		150	30	FR	1	A	A	0	0
59. Gunston School	11/30/79			X	30	3	FR	2	A	B	60	20

Table 1. (Cont'd.)

Facility	Incident Date	Hospital		Occupancy		Other	# of Patients/Occupants	# of Staff	Construction Type	Construction Height (Floors)	Interior Ceiling & Wall	Fire Zone		
		Gen'l	Mental	Hospital	Nursing Home							Floor	Corridor	Patient Room Door
60. Sheppard-Pratt	12/10/79		X				(22)76	(3)14	FR	3+B	A	A	60	20
61. Fallston General	1/27/80	X					(10)225	(2)	FR	2	A	A	60	20
62. Chesapeake Hall	2/3/80			X		X	240	7	FR	4	A	A	60	20
63. Washington Adventist	3/5/80	X					360	87	FR	4+2B	A	A	60	20
64. Patuxent Institute	3/5/80				X	X	(17)67	(1)4	PNC	3	A	A	60	20
65A. Wilson Health Center	6/25/80				X		(26)159	(5)15	FR	4+B	A	A	60	20
65B. Wilson Health Center	6/25/80				X		(26)159	(5)15	FR	4+B	A	A	60	20

*Research hospital

of Patients/Occupants in Fire Zone indicated by number in (), with # of Patient/Occupants in Building.

of Staff in Fire Zone indicated by number in (), with # of Staff in Building

Table 2. BEHAVIORAL ACTION

Facility	Incident Date	Alarm Facility		Extent of Evacuation (# of Patients, () by FD)		Means of Evacuation (# of Patients, () by FD)		Extinguishment	Closing of Doors		Ventilation by Windows
		Phone	Local	Area Floor	By FD	Bed	Wheel-chair		Other	Other	
1. St. Joseph's Hospital	8/10/77		X	34(2)	X	2	X	FD	X		X
2. Kensington Gardens	1/1/78	X		(4)		19	2	FD	X		X
3. Manor Care, Hyattsville	1/10/78		X	18		10	7		X	X	X
4. Manor Care, Adelphi	3/1/78		X	0							
5. Manor Care, Adelphi	3/1/78		X	8		8					
6. Harford Memorial	3/9/78	X		1			1	*	X		
7. Sacred Heart	3/19/78		X	1				**	X		
8. Magnolia Gardens	4/2/78		X	10		4	6		X		
9A. Univ. of MD Hospital	4/2/78		X	0					X		
9B. Univ. of MD Hospital	4/2/78		X	0					X		
9C. Univ. of MD Hospital	4/2/78		X	0					X		
9D. Univ. of MD Hospital	4/2/78		X	0					X		
9E. Univ. of MD Hospital	4/28/78		X	0					X		
9F. Univ. of MD Hospital	4/28/78		X	0					X		
9G. Univ. of MD Hospital	5/1/78		X	0					X		
9H. Univ. of MD Hospital	5/5/78		X	0					X		
9I. Univ. of MD Hospital	5/6/78		X	0					X		
9J. Univ. of MD Hospital	5/7/78		X	0					X		
9K. Univ. of MD Hospital	5/8/78		X	0					X		
10. Anne Arundel General	5/1/78		X	0		30		**			
11. Loricu	5/7/78		X	0				*			
12. Manor Care, Largo	5/9/78		X	40		8	20			X	
13. American	5/11/78	X		25			25		X		
14. Anne Arundel General	5/11/78	X		2		2		**	X		
15. Allegany County	5/16/78	X		3		1	2	**	X		
16. Sligo Gardens	6/10/78		X	1				***	X		
17. Avalon Manor	6/16/78		X	38		8	30		X		
18. St. Anne's	6/20/78		X	0				*	X		
19. Maryland General	8/8/78	X		0					X		
20. Manor Care, Largo	8/14/78		X	0					X		X(FD)
21. North Annapolis	9/6/78		X	0			10	**			
22. Manor Care, Towson	10/18/78		X	10					X		
23. Lafayette Square	10/24/78	X		0							X(FD)
24A. Sheppard Pratt	10/25/78	X		0							X
24B. Sheppard Pratt	10/26/78	X		0							X

Table 2. (Cont'd.)

Facility	Incident Date	Alarm		FD	Extent of Evacuation (# of Patients, () by FD)		Means of Evacuation (# of Patients, () by FD)		Extinguishers	Closings of Doors	Ventilation by Windows
		Facility Phone	Local		Floor	Area	Bed	Wheel-chair			
25. Anne Arundel General	11/14/78		X	X	1					X	X(FD)
26. Washington Adventist	12/9/78		X	X	0					X	X(FD)
27. Spring Grove	12/14/78	X			132					***	X(FD)
28. Washington Adventist	12/22/78	X		X	3		1		1-2A	***	X(FD)
29. Southern Maryland	1/2/79	X		X	17						X(FD)
30. Georgetown	1/9/79			X	250		9		1-5A, 60BC		X(FD)
31. Crownsville	1/26/79			X	15		1		1-5A, 10BC		X(FD)
32. University of MD	2/6/79	X		X	1		1		1-5BC		X
33. Sheppard Pratt	2/7/79	X		X	1						
34. Pikesville	2/8/79	X		X	0						
35. Ellicott City	2/14/79	X		X	520					X	X(FD)
36. Hidden Brook	2/15/79	X		X	27	8	35			X	X(FD)
37. Montgomery General	3/28/79			X	0					**	
38. University of MD	4/4/79	X		X	10(3)		2	8(3)	1-3A, 30BC	X	X(FD)
39. Sheppard Pratt	4/5/79	X		X	20				15-5A, 10BC		X
40. Taylor House	4/11/79			X							
41. University	4/13/79			X	(47)		(19)	(13)			
42. Kensington Gardens	4/14/79			X	1						
43. Thurston Hall	4/19/79	X		X						**X	X(FD)
44. NIH	4/21/79	X		X	7(1)					X	X(FD)
45. Roosevelt Hotel	4/24/79			X		3(47)	20	46		X	X(FD)
46. Mt. Wilson	6/10/79	X		X	51		50	1			X(FD)
47. Bethesda Health Ctr.	6/12/79			X	2			2			X(FD)
48. Franklin Square	6/13/79			X	0					X	X(FD)
49. Mt. Masonic Home	6/21/79			X	3				2-2A, 10BC		X(FD)
50. Sheppard Pratt	6/24/79	X		X	0				1-2A, 10BC		X(FD)
51. Reeder's Memorial	7/29/79			X	9			9		X	X(FD)
52. Union Hospital	7/29/79			X	0					X	X(FD)
53. Crownsville	8/19/79	X		X	0						X(FD)
54. Mt. Wilson	9/4/79			X	32		7	25	1-2A, 10BC	X	X(FD)

Table 2. (Cont'd.)

Facility	Incident Date	Alarm		Extent of Evacuation (# of Patients)		Means of Evacuation (# of Patients)		Extinguishment		Closing of		Ventilation by Windows
		Facility Phone	Local	Area	Floor	Bed	Wheel-chair	Extin-guishers	Patient	Other		
55. Finan Center	9/9/79	X	X	20		20	6	1-4A, 60BC				X(FD)
56. Peninsula General	9/22/79	X	X	8		8		1-2A	****			X(FD)
57. Crownsville	10/5/79	X	X	25		25		1-2A	****			X(FD)
58. Crownsville	10/12/79	X	X	25		25		1-2A				X
59. Crownsville	10/12/79	X	X	0		0		1-2A				X
60. Gunston School	11/30/79	X	X	22		30			FD	X		X(FD)
61. Sheppard Pratt	12/10/79	X	X	22		22			*			X(FD)
62. Fallsion General	1/27/80	X	X	12		10	22	2-2A	FD	X		X(FD)
63. Chesapeake Hall	2/3/80	X	X	0		240			FD			X(FD)
64. Washington Adventist	3/5/80	X	X	0		0		1-4A, 30BC	FD			X(FD)
65. Patuxent Institute	3/5/80	X	X	20(6)		67	4(4)	1-2A, 10BC	FD	X		X(FD)
66. Wilson Health Center	6/25/80	X	X	0		15(2)	2	1-2A, 10BC	FD	X		X(FD)
67. Wilson Health Center	6/25/80	X	X	0		0			FD	X		X(FD)

*De-energize Equipment

**Sink Water

***Pan or Pitcher of Water

****Another with blanket/linens

F - 22 patients were moved in wheelchairs in one evacuation phase, and carried in another.

Table 3. FIRE PROTECTION FEATURES

Facility	Date	Sprinklers		Alarm System		Detection		Smoke Barrier		Standpipe	
		Coverage Complete	Partial	Activation	Type Local	Connected To Fire	Type Thermal	Smoke	Activation		Doors
1. St. Joseph's Hospital	8/10/77										
2. Kensington Gardens	1/1/78		X		X	X	X	X	X**		X*
3. Manor Care, Hyattsville	1/10/78	X		X	X	X	X	X	X		
4. Manor Care, Adelphi	3/1/78	X			X	X	X	X	X		
5. Manor Care, Adelphi	3/1/78	X			X	X	X	X	X		
6. Harford Memorial	3/9/78	X			X	X	X	X	X		
7. Sacred Heart	3/19/78				X	X	X	X	X		
8. Magnolia Gardens	4/2/78	X			X	X	X	X	X		
9A. Univ. of MD Hospital	4/26/78		X		X	X	X	X	X		X
9B. Univ. of MD Hospital	4/27/78		X		X	X	X	X	X		X
9C. Univ. of MD Hospital	4/27/78		X		X	X	X	X	X		X
9D. Univ. of MD Hospital	4/27/78		X		X	X	X	X	X		X
9E. Univ. of MD Hospital	4/28/78		X		X	X	X	X	X		X
9F. Univ. of MD Hospital	4/28/78		X		X	X	X	X	X		X
9G. Univ. of MD Hospital	5/1/78		X		X	X	X	X	X		X
9H. Univ. of MD Hospital	5/5/78		X		X	X	X	X	X		X
9I. Univ. of MD Hospital	5/6/78		X		X	X	X	X	X		X
9J. Univ. of MD Hospital	5/7/78		X		X	X	X	X	X		X
9K. Univ. of MD Hospital	5/8/78		X		X	X	X	X	X		X
10. Anne Arundel General	5/1/78		X		X	X	X	X	X		X
11. Torlen	5/7/78	X			X	X	X	X	X		X
12. Manor Care, Largo	5/9/78		X		X	X	X	X	X		X
13. American	5/11/78		X		X	X	X	X	X		X
14. Anne Arundel General	5/11/78		X		X	X	X	X	X		X
15. Allegany County	5/16/78		X		X	X	X	X	X		X
16. Stigo Gardens	6/10/78	X			X	X	X	X	X		X
17. Avalon Manor	6/16/78		X		X	X	X	X	X		X
18. St. Anne's	6/20/78	X			X	X	X	X	X		X
19. Maryland General	8/8/78		X		X	X	X	X	X		X
20. Manor Care, Largo	8/14/78		X		X	X	X	X	X		X
21. North Arundel	9/4/78		X		X	X	X	X	X		X
22. Manor Care, Towson	10/18/78		X		X	X	X	X	X		X
23. Lafayette Square	10/24/78	X			X	X	X	X	X**		
24A. Sheppard Pratt	10/25/78		X		X	X	X	X	X		X
24B. Sheppard Pratt	10/26/78		X		X	X	X	X	X		X
25. Anne Arundel General	11/14/78		X		X	X	X	X	X		X
26. Washington Adventist	12/9/78		X		X	X	X	X	X		X

Table 3. (Cont'd.)

Facility	Date	Sprinklers		Alarm System			Detection		Smoke Barrier		
		Coverage Complete	Partial	Activation	Type Local	Connected to PD	Activation	Type Thermal	Smoke	Doors Activation	Standpipe
27. Spring Grove	12/14/78		X		X		X	X			X
28. Washington Adventist	12/22/78		X		X		X	X		X	X
29. Southern Maryland	1/2/79		X		X		X	X		X	X
30. Georgian Towers	1/9/79				X		X	X			X
31. Crownsville	1/26/79	X			X		X	X		X	X
32. University of MD	2/6/79				X		X	X		X	X
33. Sheppard Pratt	2/7/79		X		X		X	X			
34. Pikesville	2/8/79	X			X		X	X			
35. Ellicott City	2/14/79				X		X	X			
36. Hidden Brook	2/15/79				X		X	X			
37. Montgomery General	2/28/79		X		X		X	X			X
38. University of MD	4/4/79		X		X		X	X			X
39. Sheppard Pratt	4/3/79		X		X		X	X			X
40. Taylor House	4/11/79				X		X	X			
41. University	4/13/79				X		X	X			
42. Kensington Gardens	4/14/79		X		X		X	X			
43. Thurston Hall	4/19/79				X		X	X			X
44. NHD	4/21/79		X		X		X	X			X*
45. Roosevelt Hotel	4/24/79				X		X	X			
46. Mt. Wilson	6/10/79	X			X		X	X			X
47. Bethesda Health Ctr.	6/12/79	X			X		X	X			X
48. Franklin Square	6/13/79				X		X	X			
49. MD Masonic Home	6/21/79		X		X		X	X			
50. Sheppard Pratt	6/24/79		X		X		X	X			
51. Keeler's Memorial	7/29/79	X			X		X	X			
52. Balton Hospital	7/29/79		X		X		X	X			X
53. Crownsville	8/19/79		X		X		X	X			X
54. Mt. Wilson	9/4/79		X		X		X	X			X
55. Pinnacenter	9/9/79	X			X		X	X			X
56. Peninsula General	9/22/79		X		X		X	X			X
57. Crownsville	10/5/79		X		X		X	X			
58. Crownsville	10/12/79		X		X		X	X			
59. Gunston School	11/30/79		X		X		X	X			
60. Sheppard-Pratt	12/10/79		X		X		X	X			X

Table 3. (Cont'd.)

Facility	Date	Sprinklers		Alarm System		Detection		Smoke Barrier Doors Activation	Standpipe
		Coverage Complete	Partial	Activation	Type Local	Connected to Fd	Type Thermal		
61. Fallston General	1/27/79		X				X	X	X*
62. Chesapeake Hall	2/3/79				X		X	X	X
63. Washington Adventist	3/5/79		X	X			X	X**	X
64. Faluxent Institute	3/5/79						X	X	X
65A. Wilson Health Center	6/25/80	X			X		X	X	X
65B. Wilson Health Center	6/25/80	X		X			X	X	X

*Standpipe system provided with 1 1/2 inch hose.

**Smoke barrier doors are always closed.

1. ST. JOSEPH'S HOSPITAL, AUGUST 10, 1977

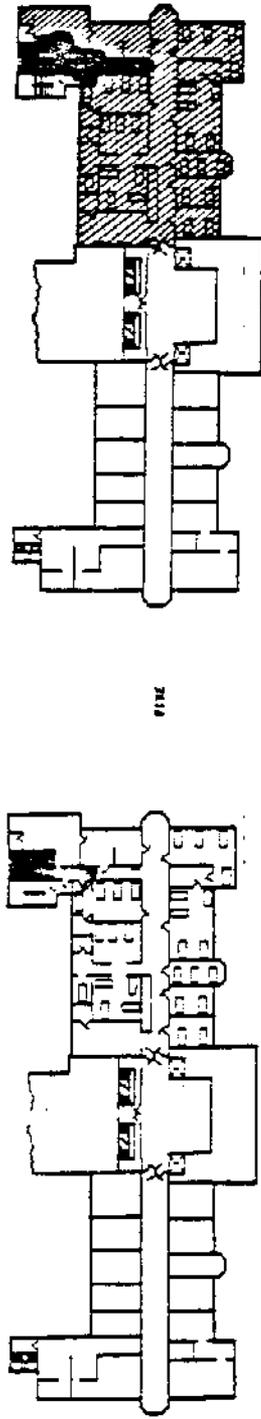
ABSTRACT

The fire incident at St. Joseph's Hospital on August 10, 1977 was detected by the nursing staff at approximately 8:45 p.m., at which time the fire had obtained a post flashover development in the area of origin a bathroom on the second floor. The four story building of ordinary construction was 130 years old. At the time of the fire incident the building had a registered occupancy of 171 patients. The fire extended from the second floor to the ceiling of the third floor through a pipe chase and the wall stud spaces.

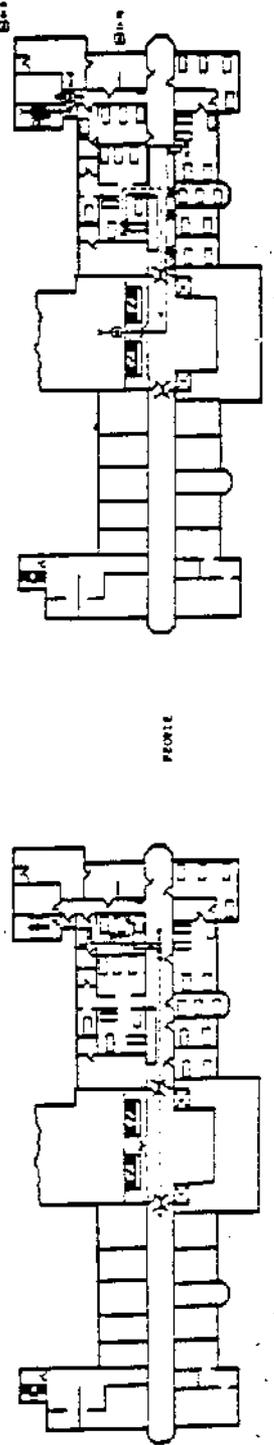
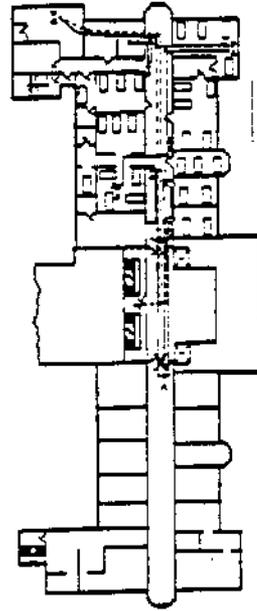
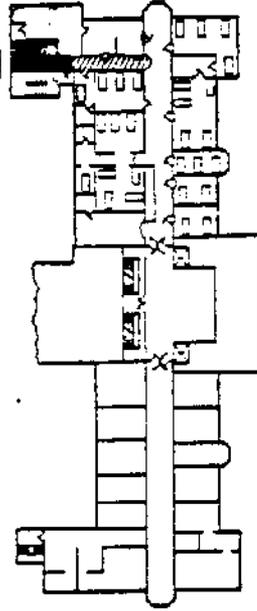
The fire department was notified automatically with the activation of the local fire alarm system within the facility at 8:48 p.m. through an auxiliary system arrangement with the public fire alarm system. The seven nursing staff assigned to the area of fire origin, the second floor west, evacuated a total of thirty-four patients in a period of 6 to 7 minutes, with twenty-two of these patients being evacuated in less than three minutes. At the time of fire department arrival on the fire floor at approximately 8:50 p.m. all the patients had been evacuated from the fire area with the exception of two male patients. The nursing staff indicated the rooms where the patients were located and the fire department personnel using breathing apparatus removed both patients. One patient could not be revived, while the other was given medical treatment and transferred to another hospital. However, this patient also died approximately one week later.

Total evacuation of the hospital was accomplished by the staff, fire and police department personnel, with assistance from some citizens. The 171 patients were evacuated in a time period from 16 to 19 minutes.

Realm 1, 2, 3, and Episode 1, 2, 3.



PIRE



PEOPLE

CONCLUSIONS

A. Behavioral Episodes.

1. The adaptive behavioral response of the nursing staff personnel during a temporal sequence of relatively short duration resulted in a significantly reduced physical and life loss.
2. The adaptive behavioral response appeared to have been influenced by the type and frequency of the drills and training with the attitude generated by the administration and staff.
3. The nursing staff personnel seemed extremely concerned and dedicated to the welfare of the patients they were normally assigned to and responsible for their care.
 - a. Nursing personnel exhibited tendencies to return to the patient areas where they were normally assigned.
 - b. Nursing personnel endured extreme conditions of smoke exposure and heat involving personal risk to assist the patients.
4. No cases of individual or group non-adaptive behavior were observed or reported by participants.
5. The complete evacuation of the 171 patients within twenty minutes with only two fatalities under the fire and smoke conditions involved was attributed to training, drills, and organization by most of the hospital staff and fire department personnel.
6. The involvement of the neighborhood citizens in the evacuation of the patients from the hospital to the church and the school appeared to be a most unique phenomenon of social dynamics considering the cultural, ethnic, and religious variables. This phenomenon could

be interpreted as an instance of validation of Lerup, Cronrath and Liu's hypothesis as reported in the following manner:¹⁰

This has lead us to hypothesize that people interpret and interact with the fire situation in rather personal, sometimes unique ways.

7. Fire department personnel were concerned and hesitant about disconnecting patient monitoring oxygen, traction and other medical equipment. Thus, a team approach with hospital personnel to prepare the patients appears to expedite evacuation.
8. The fire department personnel, although notified of the room number of where a patient remained, were unable to identify the rooms in the smoke. They indicated a need for a better method of identifying either patient room numbers or where a patient remained.

B. Fire and Smoke Realms.

1. The smoke barrier doors separating the East and West Wings and the center main stairway appeared to function as designed. These doors enabled the vertical and horizontal evacuation to proceed effectively unhampered by smoke.
2. The higher than normal ceiling heights of approximately 15 feet provided a large smoke sink area to collect the smoke. This smoke storage area appeared to increase the tenability time for patients and nursing staff in the fire zone on the second floor.
3. The automatic transmission of the alarm from the hospital internal system to the fire alarm headquarters appeared essential in providing a rapid response of the fire department.
 - a. It should be noted the recurrent behavior identified by Lerup,

¹⁰Lerup, Cronrath and Liu, op. cit., p. 29.

Greenwood, and Burke (9), consisting of a tendency to call the fire department even when it has already been notified did not occur. It is believed this was due to the training of the staff, which prohibited use of the phone, and their knowledge of the automatic transmission of the alarm with the telephone operator confirmation. In addition, the experience of the staff with the rapid response of the fire department in previous fire incidents appeared a determining factor.

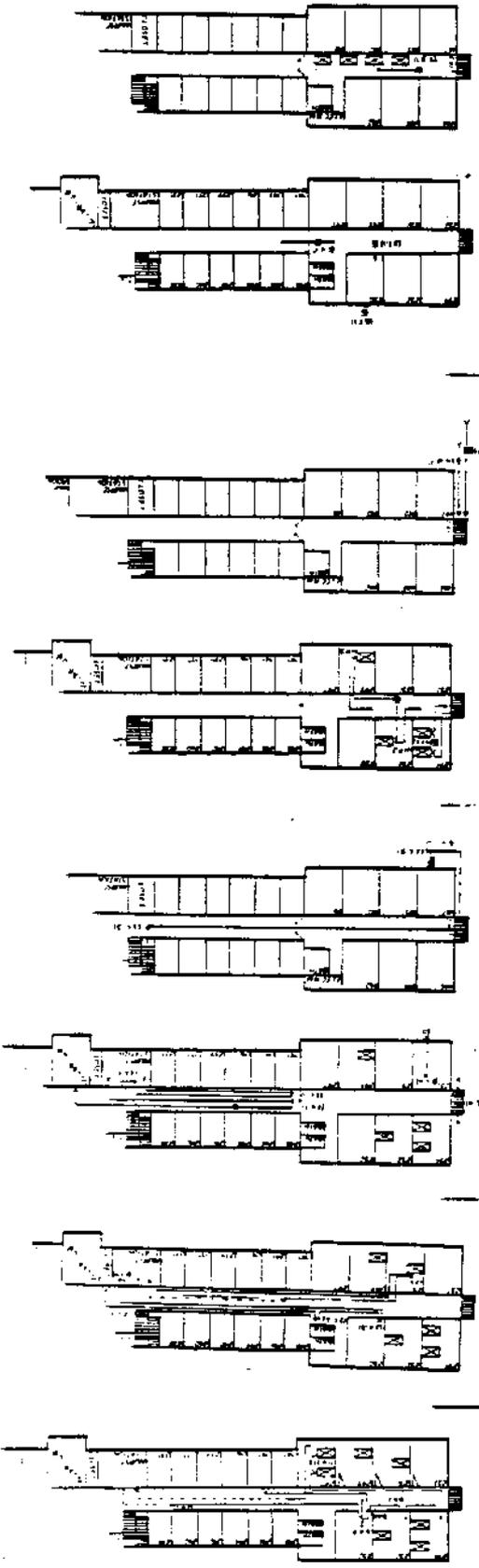
2. KENSINGTON GARDENS NURSING HOME, JANUARY 1, 1978

The fire incident at the Kensington Gardens Nursing Home on January 1, 1978 was detected by the nursing staff at approximately 9:56 a.m., at which time the fire consisted of preflashover state in patient room 250. The fire apparently originated in an upholstered chair from discarded smoking materials or matches by the room's occupant. The fire consumed the chair, spread to sheets on an adjacent bed, and the privacy curtains hanging between the beds. The fire was confined to the room of origin and did not achieve flashover. The two story building consisted of an original section of ordinary construction, erected in 1937, and a new addition of protected noncombustible construction which was six years old.

The fire department was notified at 9:59 a.m. by telephone. Housekeeping and nursing personnel assigned to the second floor, west wing, detected the fire in patient room 250 and immediately closed the door to this fire room. Other patient room doors in the fire zone were then closed, and three patients were evacuated from the fire zone before the corridor became untenable from smoke migration. The housekeeping staff directed arriving fire department personnel up the exterior stairway to the fire zone. The fire department personnel removed four male patients from patient rooms within the fire zone. The seven patients in the fire zone were evacuated by the staff and the fire department in approximately ten minutes from the time of fire detection. The closing of the door to the fire involved room, and the closing of the patient room doors appeared to be critical adaptive actions in this fire incident.

The fire department extinguished the fire with a single 1-1/2 inch hose line with an estimated 100 gallons of water. Fire and heat damage was confined to the patient room of origin, with smoke odor and discoloration in the corridor. The smoke barrier doors in the corridor effectively prevented the migration of smoke throughout the second floor.

PEOPLE



156

DEPARTMENT

COMMONS

10 30

COURTYARD

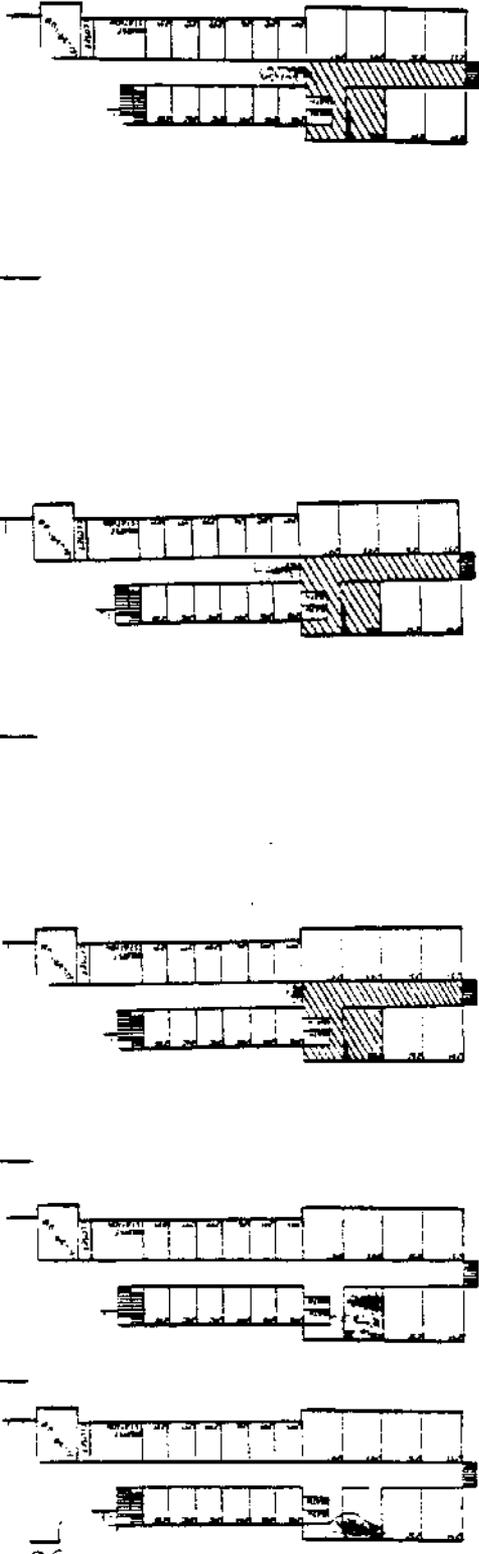
10 03

FINE ARTS

10 06

EMERGENCY

FILE



CONCLUSIONS

A. Behavioral Episodes.

1. The adaptive behavioral response of the nursing and housekeeping staff personnel during a temporal sequence of relatively short duration resulted in a significantly reduced physical and life loss.
2. The adaptive behavioral response of closing room doors and evacuating patients appeared to have been influenced by the type and frequency of the drills and training with the attitude generated by the administration and staff.
3. The behavioral response of the staff personnel in isolating the fire in room 250, and protecting the patients by the immediate closing of room doors was primarily responsible for the successful outcome.
 - a. Staff personnel exhibited tendencies to return to the patient areas where they were normally assigned.
 - b. Nursing, housekeeping and administrative personnel continually attempted to enter the fire zone under extreme and heavy smoke conditions to evacuate the four remaining patients.
4. No cases of individual or group non-adaptive behavior were observed or reported by participants.
5. The cooperative evacuation of the seven patients under the fire and smoke conditions involved was attributed to the drills, and organization of the facility staff and the training and effectiveness of the fire department personnel.
6. The secondary phone call to the fire department to obtain their confirmation of receipt of the alarm and their response as characteristic of nursing home fire incidents as observed by Lerup, Greenwood, and Burke, (9) apparently was observed in this fire incident.

10. The fire department personnel identified rooms previously searched for occupants by placing a pillow in front of the closed door.

B: Fire and Smoke Realms.

1. The smoke barrier doors separating the new addition from the main building on the second floor functioned effectively in confining the smoke to the new addition.
2. The small opening in the wall between the room of origin and the utility room above the suspended ceiling facilitated the smoke spread.
3. The 1-3/4 inch solid wood core patient room doors and the partition walls provided areas of refuge for the four patients rescued by the fire department with no ill effects.
4. Some staff personnel exhibited movements which involved extensive physical activity and reentry of the building and attempted reentry of the fire zone.
5. The organization of the staff to prepare for the care and treatment of the patients removed by the fire department on the first floor, and the preparation of the access to the fire zone by the unlocking of the exterior stair doors facilitated the rescue operations.
6. There appeared to be some hesitation in the initiation of the alarm within the facility and the manual alarm stations within and adjacent to the fire zone apparently were not activated with the staff preferring to utilize the intercom system and the phone.
7. One of the two patients in room 254, physically resisted the fire fighter who rescued him.

3. MANOR CARE, HYATTSVILLE NURSING HOME, JANUARY 10, 1978

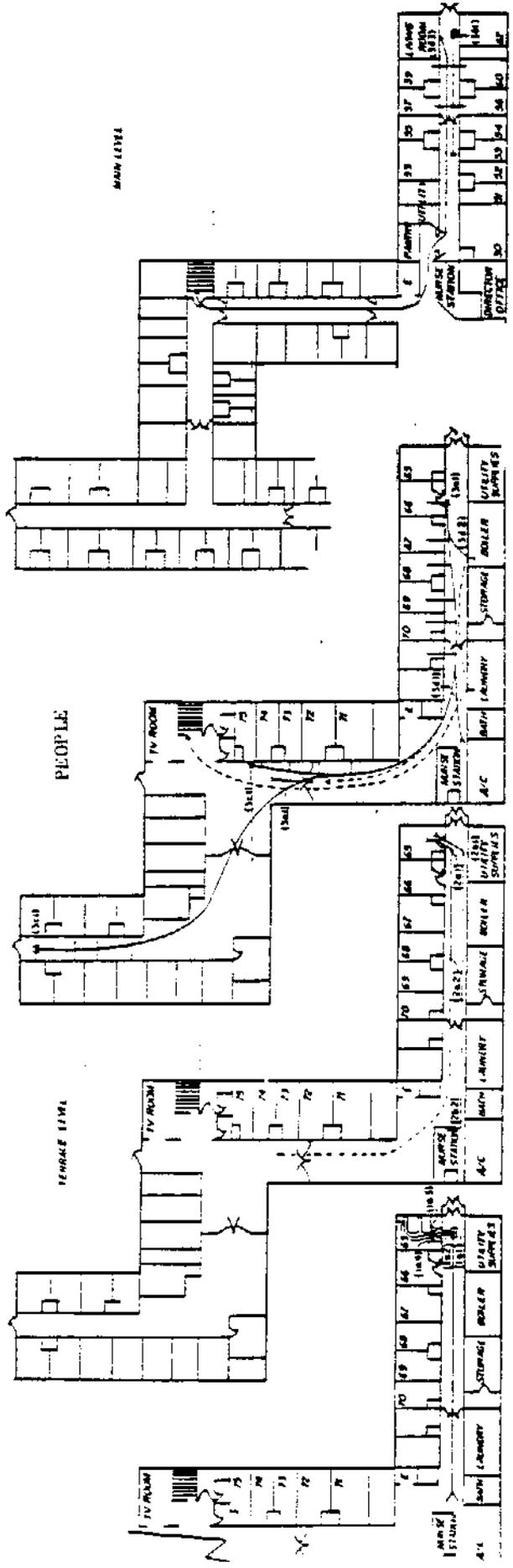
The fire incident at the Manor Care, Hyattsville Nursing Home on January 10, 1978 was detected by the nursing staff at approximately 2130. The fire at detection involved multiple ignitions, some of which had self extinguished. A preflashover fire was detected in the bathroom of the patient room of fire origin, room 65. The two story building of fire resistive construction was approximately 12 years old. At the time of the fire incident the building had a registered occupancy of 126 patients. The fire was confined to the bathroom by staff action and extinguished by the operation of a single automatic sprinkler head.

The facility alarm was activated and the fire department notified by telephone calls. The ten nursing staff on duty evacuated a total of ten patients from the fire zone on the terrace level and eight patients from the area above the fire zone in approximately 6.5 minutes, and was completed before the arrival of the fire department. The fire department confirmed extinguishment and performed overhaul and smoke removal operations.

CONCLUSIONS

A. Behavioral Episodes.

1. The adaptive behavioral response of the nursing staff personnel during this fire incident with a temporal sequence of approximately 8 minutes prevented injury to the patients and reduced the physical loss.
2. The adaptive behavioral response of closing room doors and evacuating 18 patients appeared to have been influenced by the frequency of drills and training with the reinforcing influence of the previous fire incident in July, 1977.
3. The behavioral response of the nursing staff in isolating the fire in the bathroom of room 65, and in removing the patient under duress appeared to have been influenced by both training and experience.



IGNITION OF
DRESSER AND
BATHROOM

STAFF INVESTIGATES
AUTO-EXTINGUISHER

FIRE IN BATHROOM
CONTINUES TO DEVELOP

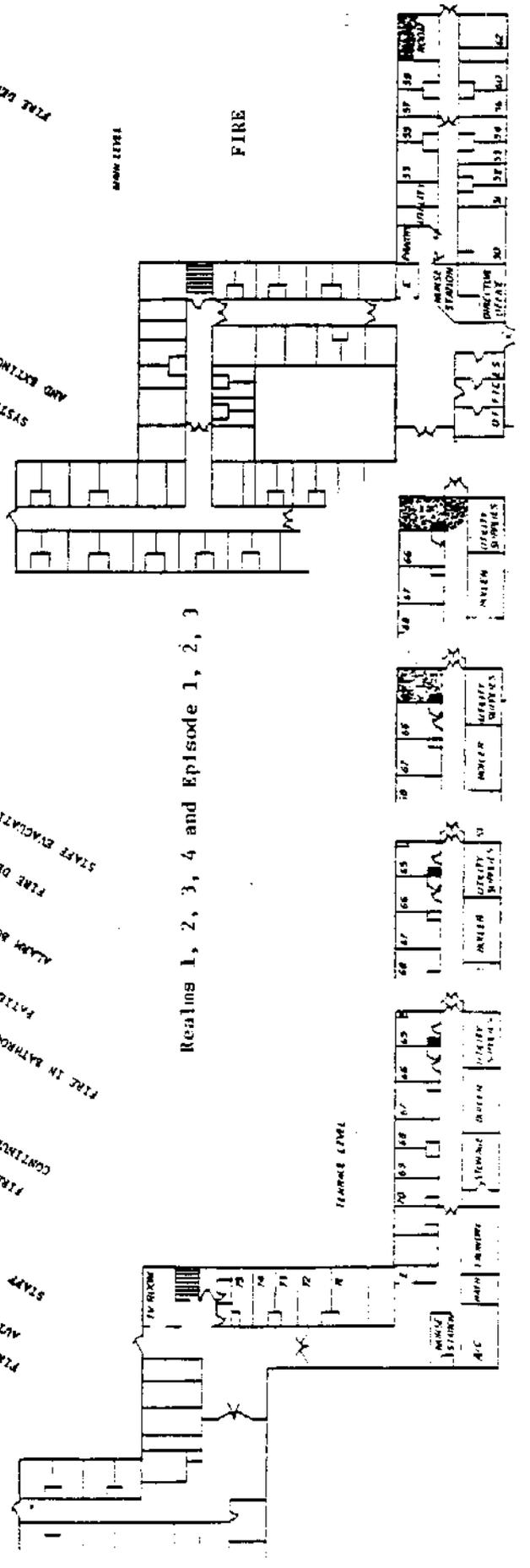
FIRE IN BATHROOM DISCOVERED
PATIENT EVACUATED

ALARM BOX ACTIVATED
FIRE DEPT. NOTIFIED

STATE EVACUATION COMMENCES

SPRINKLER
SYSTEM ACTIVATES
FIRE
AND EXTINGUISHES FIRE

FIRE DEPT. ARRIVES



Realms 1, 2, 3, 4 and Episode 1, 2, 3

4. No cases of individual or group non-adaptive behavior were observed or reported by participants.
5. The nursing staff identified patient rooms occupied by personnel by placing linen in front of the closed room doors. This procedure is the opposite of the procedure followed in the Kensington Gardens Nursing Home Fire incident where pillows placed in front of patient rooms indicated the rooms had been evacuated (3).
6. The facility has the emergency procedure and training which results in multiple phone notifications to the fire department. Thus, in this incident three staff members notified the fire department with one member initiating two notifications.

B. Fire and Smoke Realms.

1. The 1-3/4 inch solid wood core patient room doors and the patient room walls restricted the fire propagation to the bathroom, and the smoke migration to room 65.
2. The fire in the bathroom of room 65 was extinguished by the operation of the standard wet pipe automatic sprinkler system with the activation of a single sprinkler head.
3. The manual fire alarm system operated as designed, and effectively activated the automatic closing of the smoke barrier doors throughout the facility, on both levels.
4. The arrangement of the beds and the rooms on the main level which allowed the patients to be moved from the exposure area in their beds facilitated the secondary evacuation.

4. MANOR CARE, ADELPHI NURSING HOME, MARCH 1, 1978

The fire incident in the kitchen at the Manor Care, Adelphi Nursing Home on March 1, 1978 was detected by the cook at approximately 0615. The fire at the time of detection consisted of grease burning on the side of the stove with light smoke and flames approximately eighteen inches high. The two story building of fire resistive construction was approximately ten years old. At the time of the fire incident, the building with a capacity for 210 patients, had a registered occupancy of 185 patients.

The cook extinguished the fire with a ten pound all purpose listed (16) dry chemical extinguisher. The local alarm system of the facility was not activated, the fire department was not notified, and since patients were not in the fire zone, no evacuation was initiated.

CONCLUSIONS

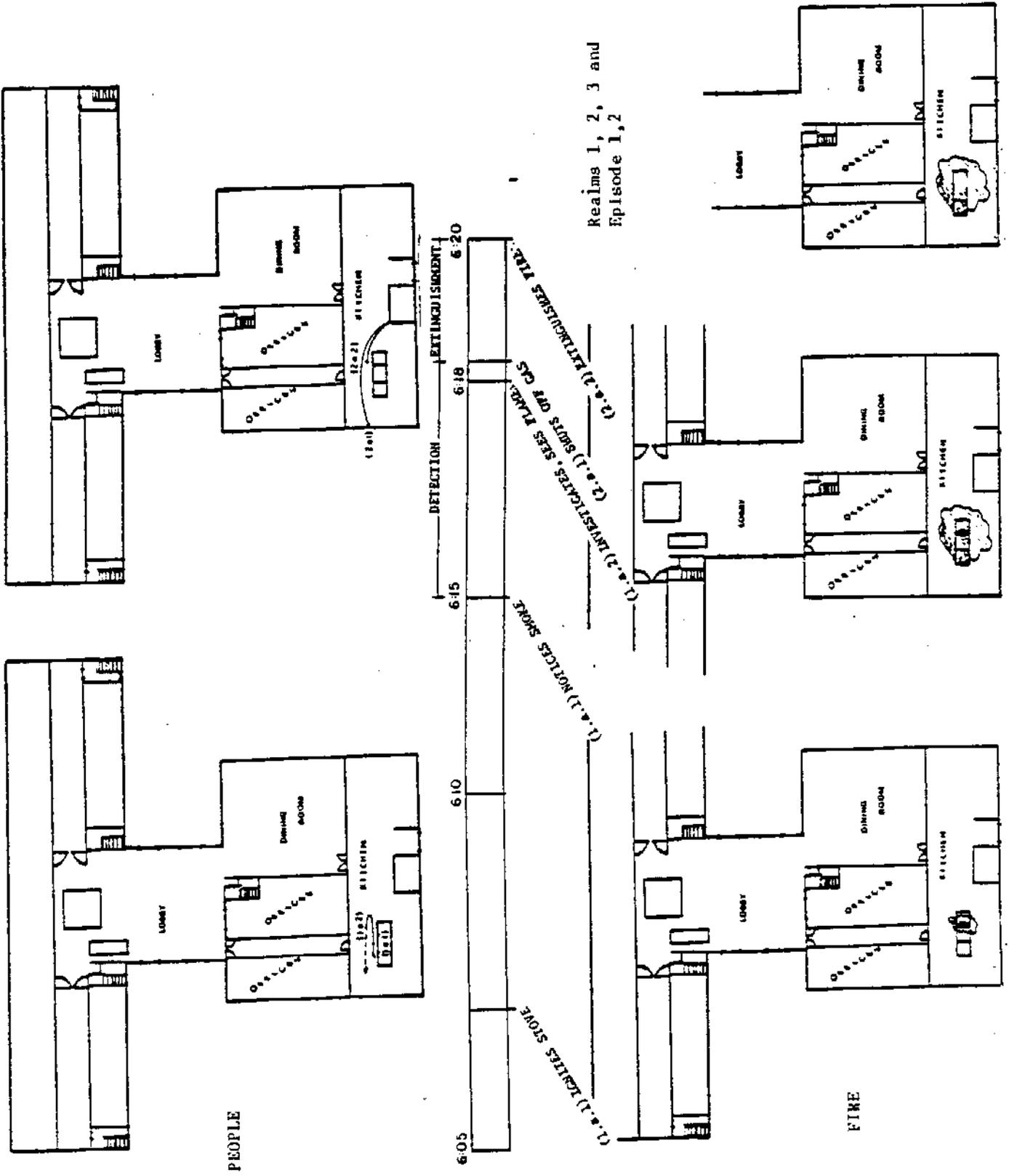
A. Behavioral Episodes.

1. The kitchen personnel in this fire incident at no time perceived a threat to herself or the patients. Thus, she did not activate the fire alarm in the facility or notify the fire department.

2. The behavioral response of the kitchen personnel in successfully extinguishing the fire and not activating the facility fire alarm or notifying the fire department did not correspond with the fire emergency procedures established by the facility.

a. This behavioral action, not in accordance with the fire emergency procedures of the facility, may have been precipitated by a recognition of the nonthreatening aspect of the fire incident and previous grease smoking occurrences.

3. The cook successfully operated the ABC dry chemical extinguisher and effectively extinguished the fire.



Reams 1, 2, 3 and
Episode 1,2

4. The ABC dry chemical extinguisher was properly charged and operated as designed in the fire incident.

B. Fire and Smoke Realms.

1. The smoke propagation and development from the fire incident was not extensive.

2. The flame and heat development at the time of maximum fire propagation during Realm 3 did not become severe enough to activate any of the 160°F ordinary rated automatic sprinkler heads in the kitchen.

5. MANOR CARE, ADELPHI NURSING HOME, MARCH 1, 1978

The fire incident in the patient room 229 at the Manor Care, Adelphi Nursing Home on March 1, 1978 was detected by the nursing staff at approximately 1230. The two story building of fire resistive construction was approximately ten years old. At the time of the fire incident, the facility, with a capacity of 210 patients, had a registered occupancy of 185 patients.

The fire incident consisted of an electrical short circuit in a heating and air conditioning unit in the exterior wall of patient room 229. Eight patients in the fire zone were evacuated by the nursing staff to adjacent areas or the second floor. The facility local alarm system was actuated, the facility emergency procedures were initiated, and the fire department notified by telephone. The fire department responded and the evacuation of patients was completed upon their arrival. The electrical unit was disconnected.

CONCLUSIONS

A. Behavioral Episodes.

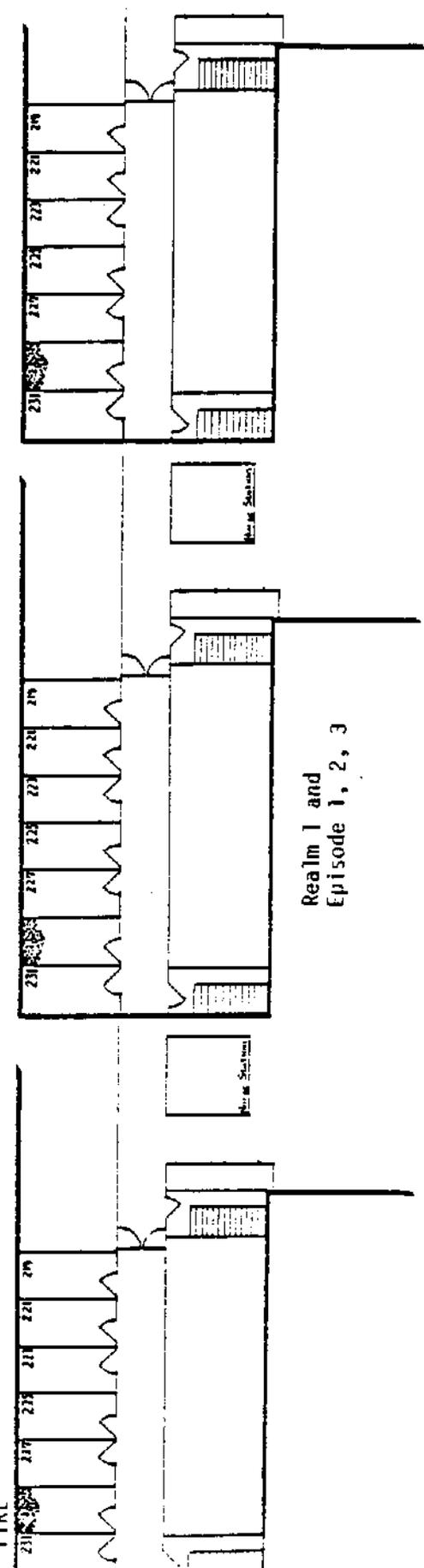
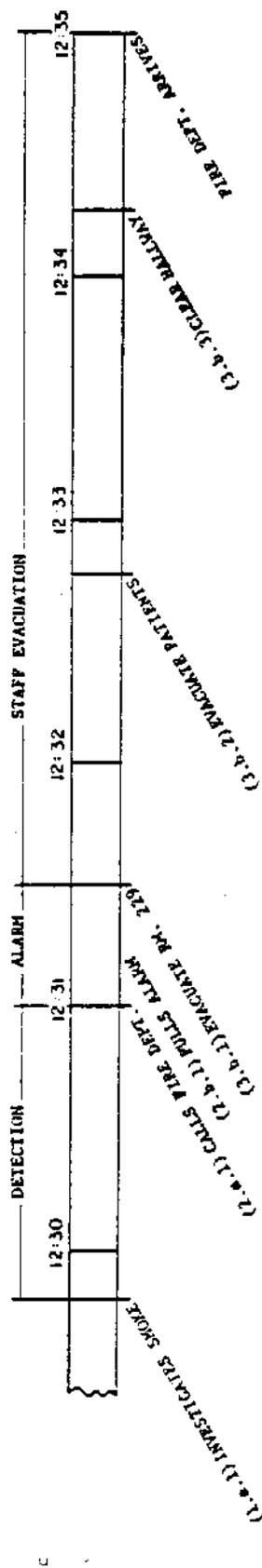
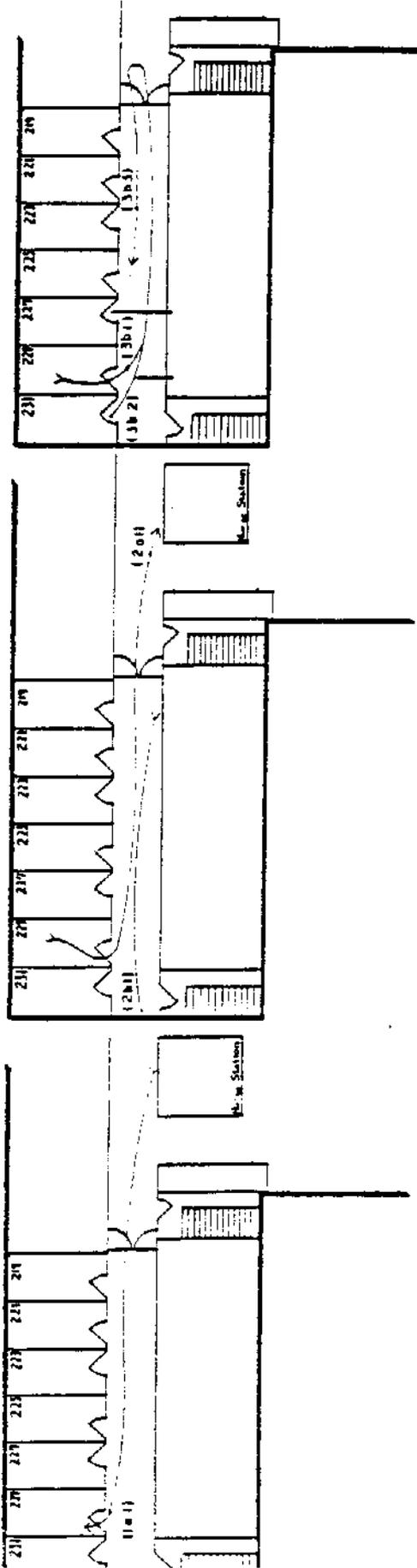
1. The nursing personnel in this fire incident perceived a threat to the patients in the facility, but not to themselves.

2. The behavioral response of the nursing staff, with the exception of the identification of the room of smoke origin, followed the fire emergency procedures established by the facility.

a. The alarm and fire reporting procedures were followed and functioned effectively.

b. The evacuation procedure by the staff followed the facility established emergency procedures, effectively and efficiently.

PEOPLE



Realm 1 and
Episode 1, 2, 3

B. Fire and Smoke Realms.

1. The manual fire alarm system operated as designed, and effectively activated the automatic closing of the smoke barrier doors throughout the facility.

2. The smoke development was light and did not extend from the ceiling area immediately above the unit in room 229, although the odor penetrated the corridor of the south wing, second floor.

3. The arrangement of the rooms, room doors and the beds, which allowed the patients to be moved from the fire zone in their beds facilitated the evacuation.

6. HARFORD MEMORIAL HOSPITAL, MARCH 9, 1978

The fire incident at the Harford Memorial Hospital on March 9, 1978 was detected by the nursing staff in response to a patient's cries at approximately 0315 hours. The four nursing staff members upon entering patient room 373 observed the linen involved for an area of approximately 1.5 square feet and flames with a height of approximately 1 foot adjacent to the patient. The facility has a capacity of 289 patients and at the time of the fire incident 279 patients were registered. The building containing the patient areas is approximately eight years old of fire resistive construction.

Upon observing the fire, two of the nursing staff immediately removed the patient while the other two pulled the flaming linen on the floor and extinguished the fire with a 2-1/2 gallon labelled pressurized water extinguisher. The door to room 373 was closed, the hospital security notified, the patient placed in another room and other patients reassured. The facility local alarm system was not activated, the facility emergency procedures were not initiated and the fire department was not notified.

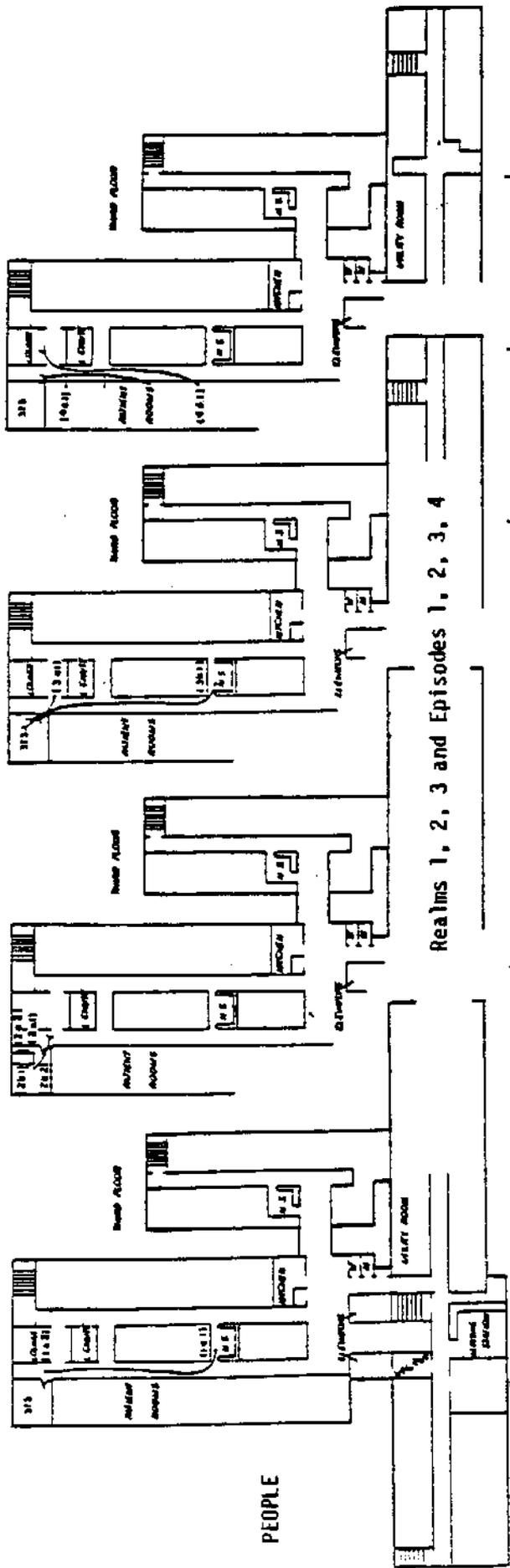
CONCLUSIONS

A. Behavioral Episodes.

1. The nursing personnel in this fire incident perceived the fire in the bed to be a severe threat to the patient, but not a threat to themselves or the other patients.

2. The immediate actions of the nursing staff to separate the patient from the flame exposure prevented any fire induced injuries to the patient.

a. The smothering of the flames with other bed linen, the removal of the flaming linen from the bed and the activation of the extinguisher to suppress the fire were accomplished by the staff without concern



for their personal safety and without injury.

3. The registered nurse successfully operated the 2-1/2 gallon pressurized water extinguisher and effectively extinguished the fire. This procedure was familiar to the nurse due to the hospital training program with both instructions and practice with the extinguishers.

4. The 2-1/2 gallon pressurized water extinguisher was properly charged and operated as designed in the fire incident.

5. The fire reporting procedure of the facility was not adhered to in this incident since the fire was extinguished during the evacuation of the patient, and the staff did not want to awaken the entire hospital once the incident was controlled.

8. Fire and Smoke Realms.

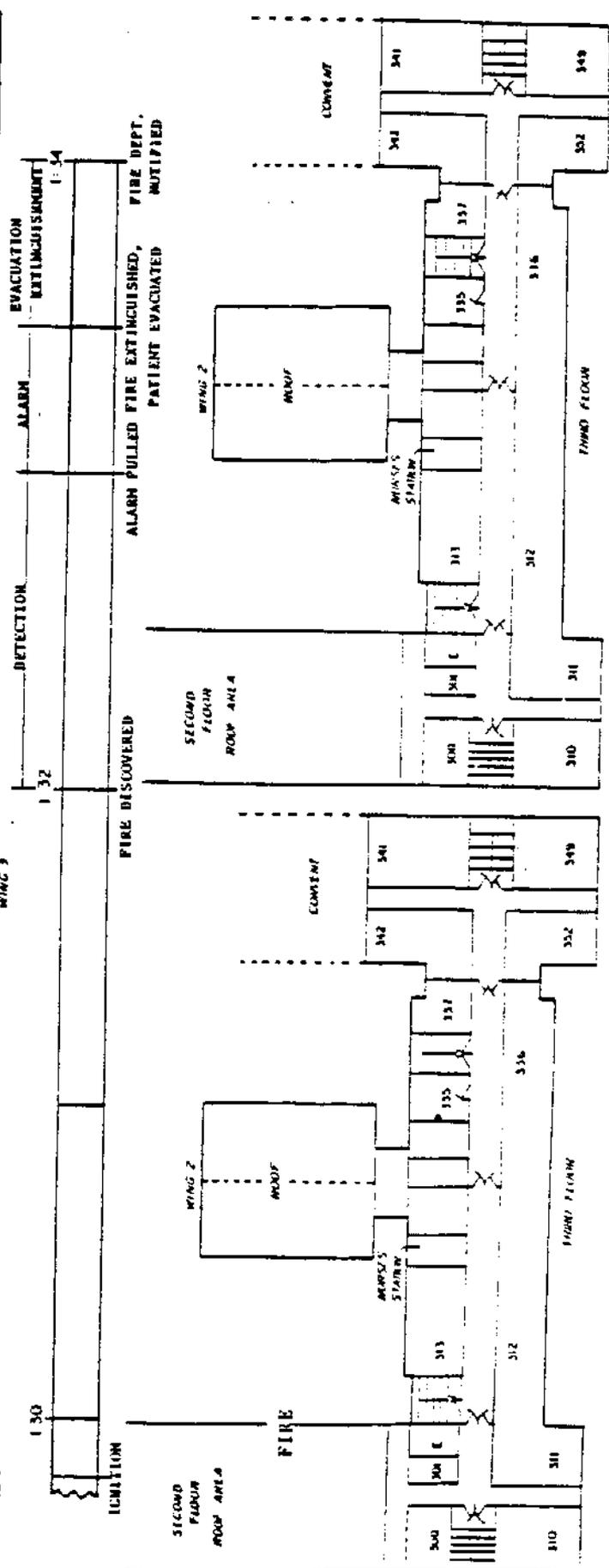
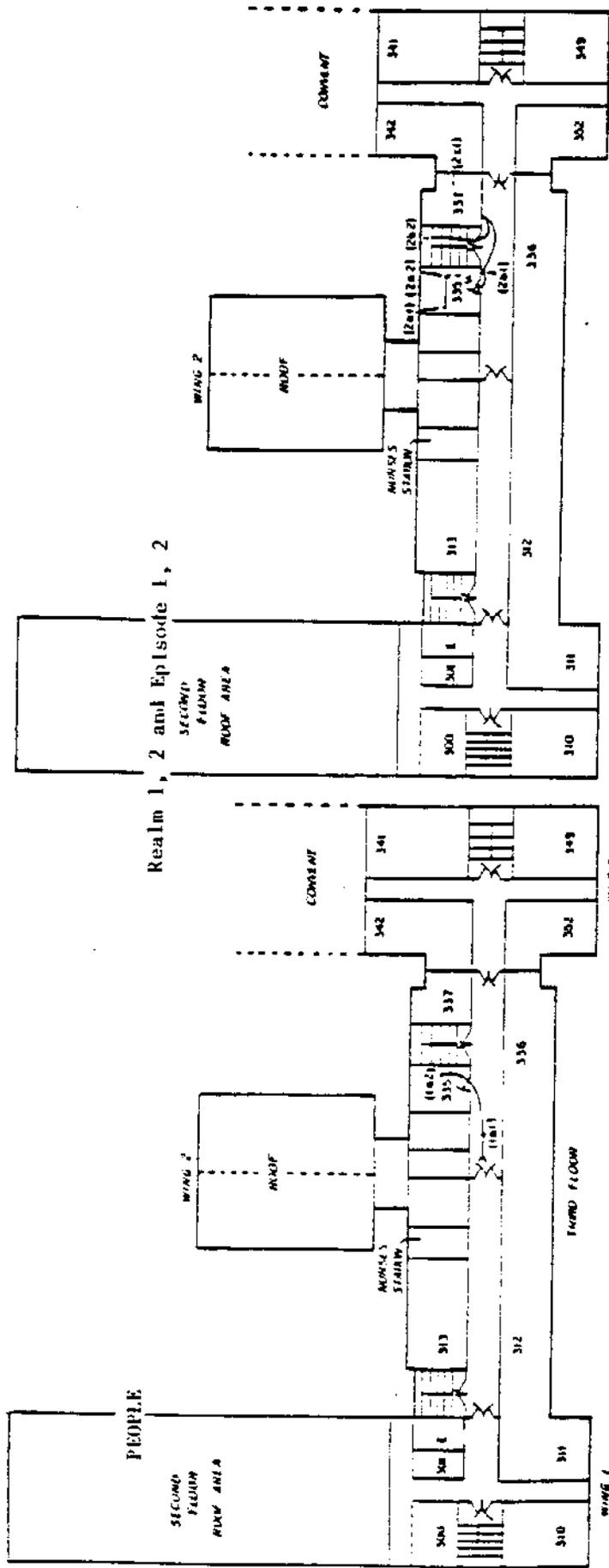
1. The smoke barrier doors were not activated by the smoke detectors due to insufficient smoke in the corridor at the doors since the room of fire origin was the most remote room on the wing.

2. The smoke propagation was limited primarily to the room of fire origin.

7. SACRED HEART HOME, MARCH 19, 1978

The fire incident at the Sacred Heart Home on March 19, 1978 was detected by the nursing staff at approximately 1330 hours. The nursing staff was investigating an odor of smoke on the third floor when the fire was detected in patient room 335, with flames issuing from a waste basket to a height of approximately eighteen inches. The facility has a capacity of 102 patients and at the time of the fire incident, had a registered capacity of 101 patients. The facility has the main building of protected noncombustible construction, approximately forty-two years old and the north wing added approximately fourteen years ago of fire resistive construction.

Upon detection of the fire, the nursing staff activated the local alarm system, which automatically transmits a signal to the fire department by a central station system arrangement, (15) and also phoned the fire department. The nursing staff extinguished the waste container fire with water from the sink in room 335, evacuated the one ambulatory patient from room 335 and closed the patient room door. The fire emergency procedures of the facility were initiated by all the staff, the fire department responded and verified the extinguishment. There was reported to be no visible smoke accumulation in patient room 335 or the third floor corridor.



REALM 1, 2 and Episode 1, 2

FIRE DISCOVERED

ALARM PULLED FIRE EXTINGUISHED, PATIENT EVACUATED, FIRE DEPT. NOTIFIED

EVACUATION
EXTINGUISHMENT
1:34

DETECTION

ALARM

PEOPLE

FIRE

EVACUATION

WING 3

WING 4

WING 1

WING 2

WING 3

CONCLUSIONS

A. Behavioral Episodes.

1. The adaptive response of the charge nurse in extinguishing the trash receptacle fire eliminated any threat of a developing fire incident and smoke propagation to the third floor corridor.

2. The adaptive action of closing the patient room door following extinguishment and the evacuation of the patient was in conformance with the established emergency procedures of the facility.

3. The investigation, alarm, fire department notification, and evacuation procedures followed by the nursing staff in this fire incident were in compliance with the emergency procedures of the facility and were effective in confining the fire.

B. Fire and Smoke Realms.

1. The fire development was confined to the trash receptacle in room 335, and smoke propagation was limited to room 335.

2. The local manual fire alarm system operated as designed, and effectively activated the automatic closing of the smoke barrier doors throughout the facility.

3. The thermal operated rate of rise detection system in the facility was not activated by the fire development in the trash receptacle in room 335.

4. The central station alarm service for the facility received the signal for activation of the manual alarm system and notified the fire department as designed and expected.

8. MAGNOLIA GARDENS NURSING HOME, APRIL 2, 1978

The fire incident at the Magnolia Gardens Nursing Home on April 2, 1978 was detected by the nursing staff at approximately 1510 hours. A member of the nursing staff noticed smoke issuing from a ceiling ventilation diffuser in the second floor lounge area. The facility has a capacity of 104 patients and 102 patients were registered at the time of the fire incident. The facility is a two story protected noncombustible construction fully sprinklered building.

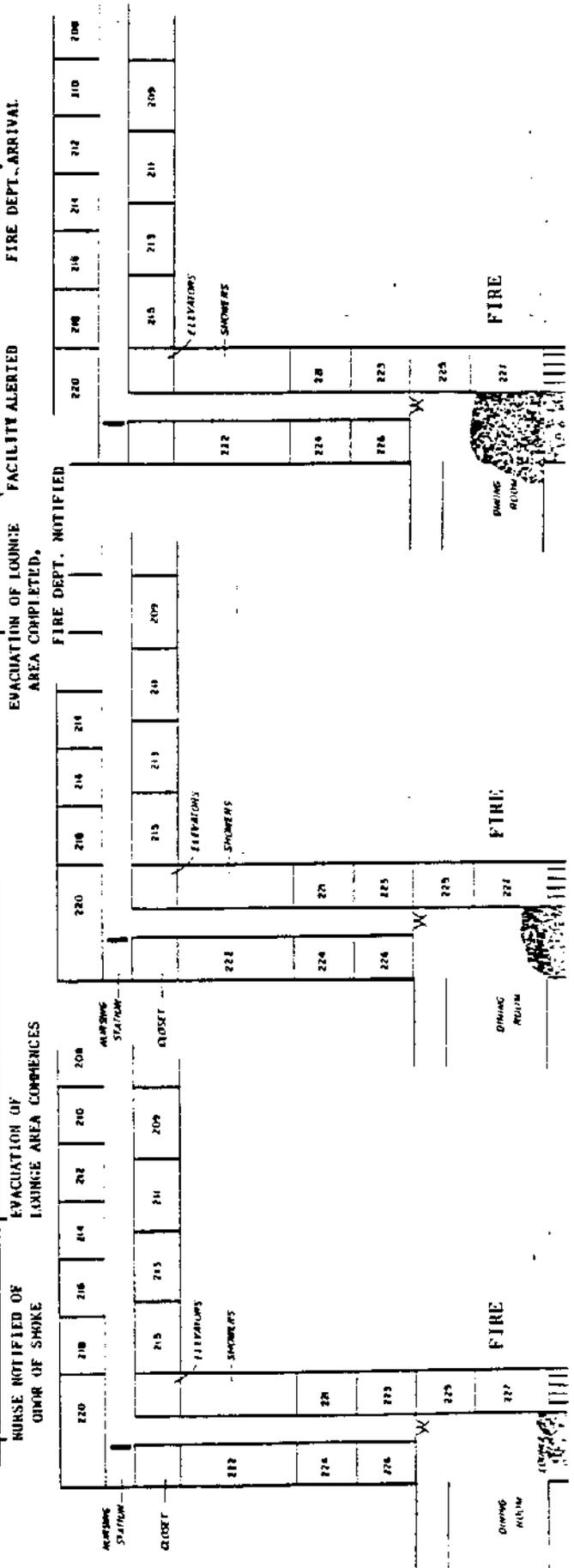
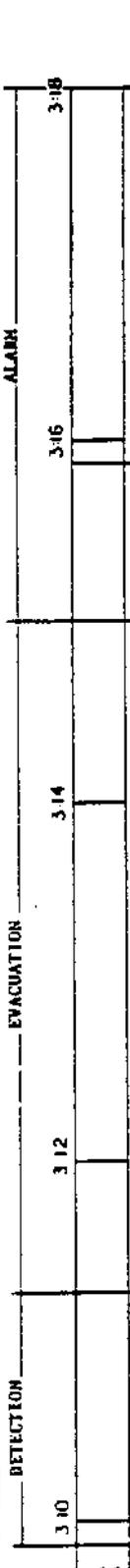
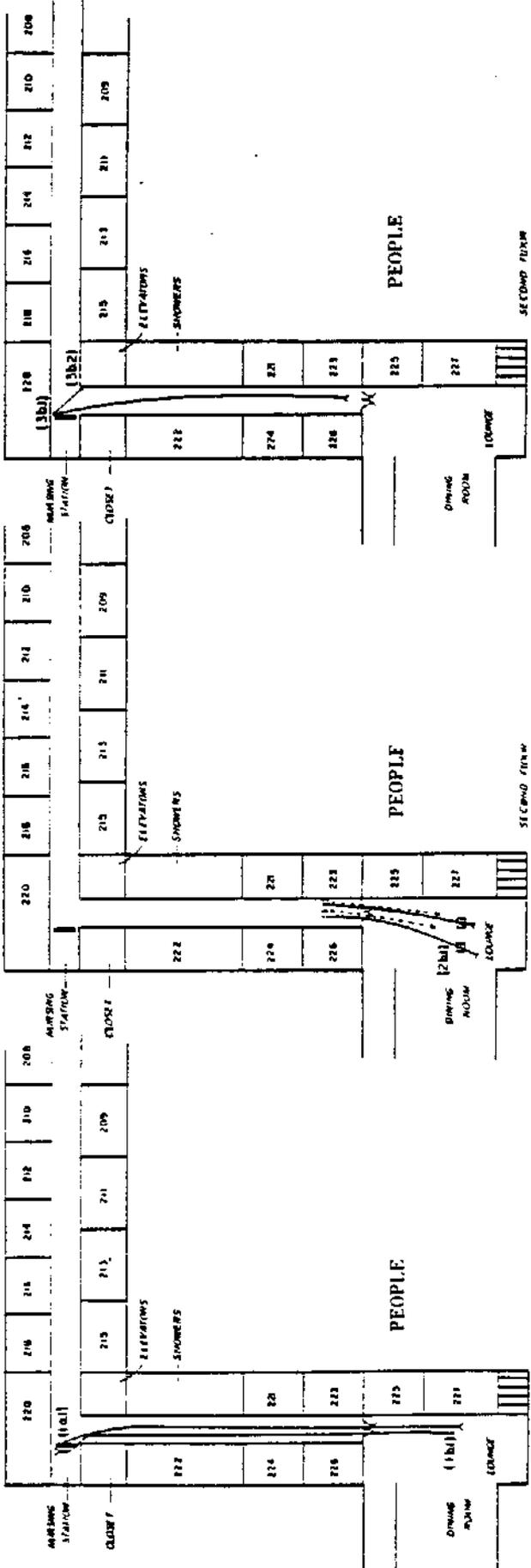
Upon the detection of the smoke in the second floor lounge area, the ten patients in the area were evacuated through smoke barrier doors to an adjacent area of the second floor. The patients involved were ambulatory or in wheelchairs. The nursing staff then notified the fire department by phone and activated the facility local alarm system. The facility emergency procedures were initiated, the fire department responded and determined the cause of smoke as an electrical motor failure. No smoke detectors or automatic sprinkler heads activated.

CONCLUSIONS

A. Behavioral Episodes.

1. The adaptive behavior response of evacuation of the patients and alarm activation appeared to have been influenced by the frequency of drills and training.

2. The facility emergency procedure instructed the staff members to activate the facility alarm system and then call the fire department. This sequence of alarm initiation was inverted in this fire incident.



3. Patients were upset that they were being moved from the lounge area for what they perceived to be another fire drill. They were very calm and casual about the evacuation due to the previous fire drill conditioning.

4. The action of the staff in immediately evacuating the ten patients from the second floor lounge area prevented any possibility of patient injury or illness due to smoke exposure.

B. Fire and Smoke Realms.

1. The local manual fire alarm system operated as designed and effectively activated the automatic closing of the smoke barrier doors throughout the facility, on both levels.

2. The smoke development and accumulation in the second floor lounge did not attain a density level sufficient to activate the smoke detectors at the smoke barrier doors separating the patient room areas.

3. The fire incident did not produce any appreciable thermal increase at ceiling level, thus no heads on the wet pipe sprinkler system were activated.

9. UNIVERSITY OF MARYLAND HOSPITAL, APRIL 26 - MAY 8, 1978

The eleven fire incidents at the University of Maryland Hospital from April 26 to May 8, 1978 involved incipient fires in trash containers in rest rooms and corridors. The fire incidents were all suspected to be of an intentional incendiary origin. The University of Maryland Hospital complex consists of four interconnected buildings of fire resistive construction varying in age from four to forty-five years of age. The hospital complex has a total patient capacity of 864 persons.

These eleven fire incidents involved limited flame involvement and smoke production. The Baltimore City Fire Department was notified and responded in five of the incidents. The remaining six fire incidents were extinguished by the University of Maryland Hospital staff or security personnel. Evacuation was not initiated in any of the fire incidents.

CONCLUSIONS

A. Behavioral Episodes.

1. The emergency fire procedures of the hospital were initiated with notification of the Baltimore City Fire Department in five of the eleven fire incidents.

2. Evacuation of staff or patients was not initiated in any of these eleven fire incidents due to the perceived low threat level and the isolated location of the incidents, primarily occurring in rest rooms.

3. The prevalent method of fire extinguishment by staff and security personnel utilized water from the rest room sink.

B. Fire Realms.

1. The only change occurring in the environment due to these fire incidents involved light smoke in the rest rooms and an odor of smoke in the corridors.

10. ANNE ARUNDEL GENERAL HOSPITAL, MAY 1, 1978

The fire incident at the Anna Arundel General Hospital on May 1, 1978 was detected by a Registered Nurse at approximately 0100. The nurse was summoned to room 414 of A building by the patient's call button. The patient indicated his lighter had exploded injuring his hand. The eight story building of fire resistive construction was approximately nine years old. At the time of the fire incident the facility had a full patient capacity of 277 patients.

No patients were evacuated. There was no visible fire or smoke observed by the staff, although an odor of lighter fluid was present and the patient suffered minor first degree burns to one hand. The fire involving the lighter appeared to have self extinguished. The facility fire emergency procedures were initiated, and the city of Annapolis Fire Department responded.

CONCLUSIONS

A. Behavioral Episodes.

1. The adaptive actions initiated by the nurse were performed in an essentially ambient environment, perceived as non-threatening to both staff and the patient.

2. The adaptive action of the nurse with the immediate activation of the local alarm system and initiation of the facility fire emergency procedures, following the patient's description of the fire incident appeared to have been determined by the training and frequency of alarms at the facility.

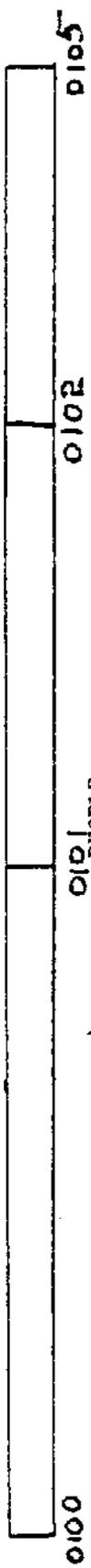
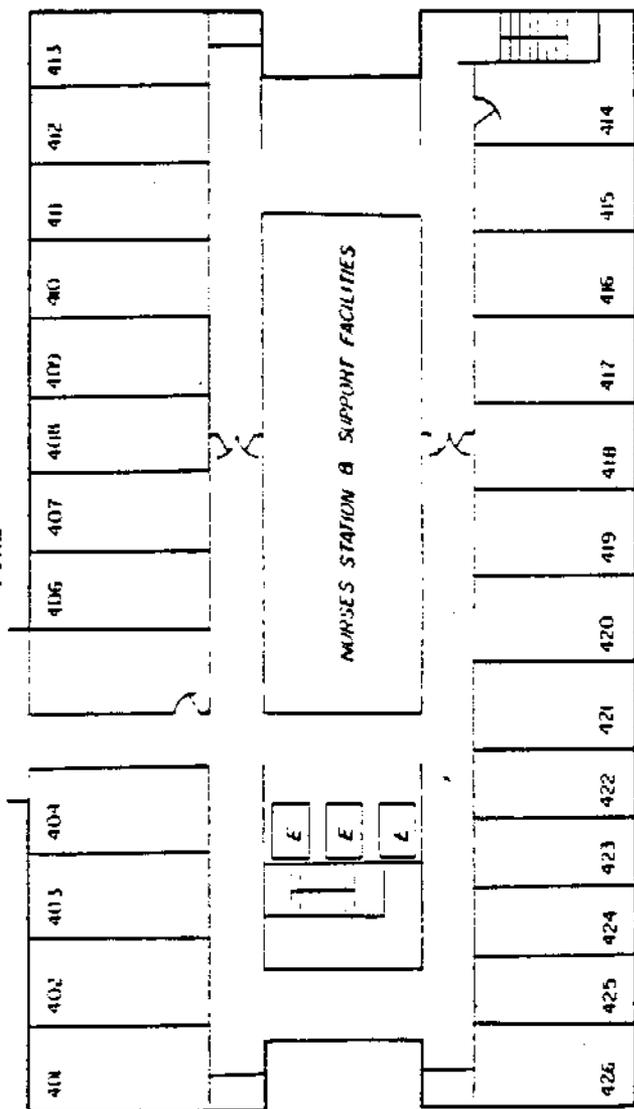
3. The staff of the hospital effectively initiated the facility emergency procedures, and performed as instructed to limit the fire spread and prevent injuries.

B. Fire Realms

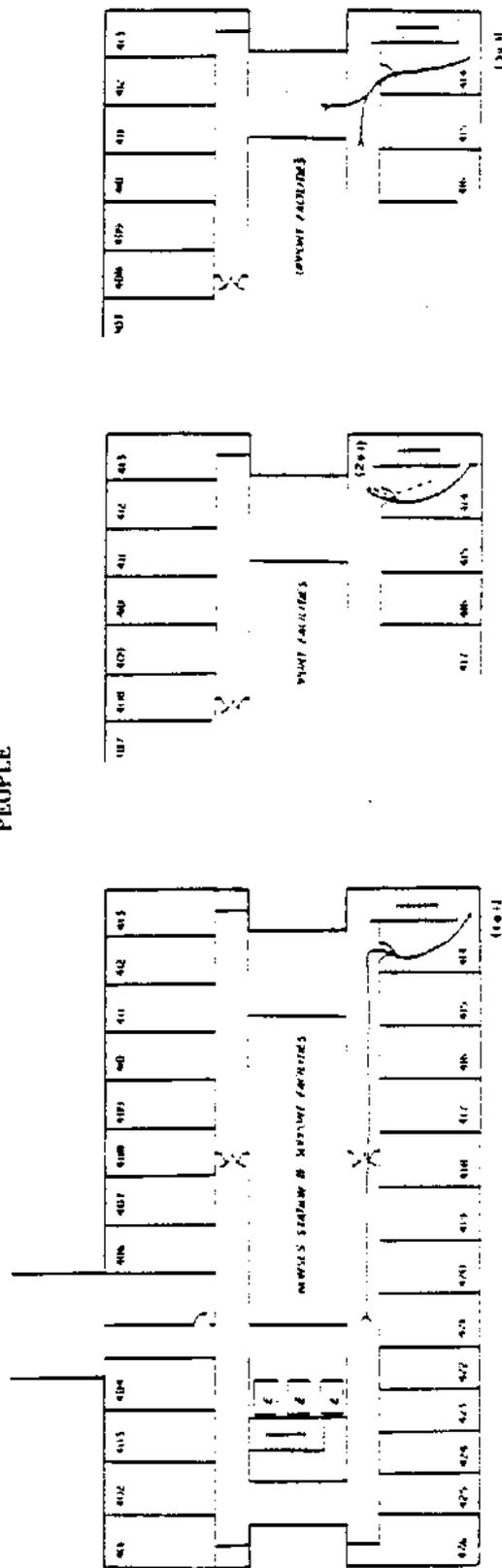
1. There was no change in the ambient environment due to this fire incident. Physically, the area of the fire incident, room 414 was unaltered throughout the fire incident.

2. The smoke barrier doors operated as designed with the closing of the doors upon activation of the local alarm system. (10)

FIRE



0101 PEOPLE



Realm 1, and Episodes 1, 2, 3

11. LORIEN NURSING HOME, MAY 7, 1978

This report presents the analysis of the fire incident at approximately 1024 on Sunday morning, May 7, 1978 at the Lorien Nursing Home in Columbia, Howard County, Maryland. This fire incident involved an odor of smoke initially detected adjacent to a vacant patient room on the second floor of the three story, fire resistive construction, fully sprinklered building.

The facility fire reporting procedure was initiated, the fire department was notified and responded. Patients were retained in their rooms with the doors closed on the second floor, while approximately thirty patients were evacuated from the third floor by the four nursing staff members assigned to this area.

The odor of smoke was determined to have been caused by the overheating of an automatic transfer switch in an enclosed metal panel box in the emergency generator room on the first (ground) floor of the building.

CONCLUSIONS

A. Behavioral Episodes.

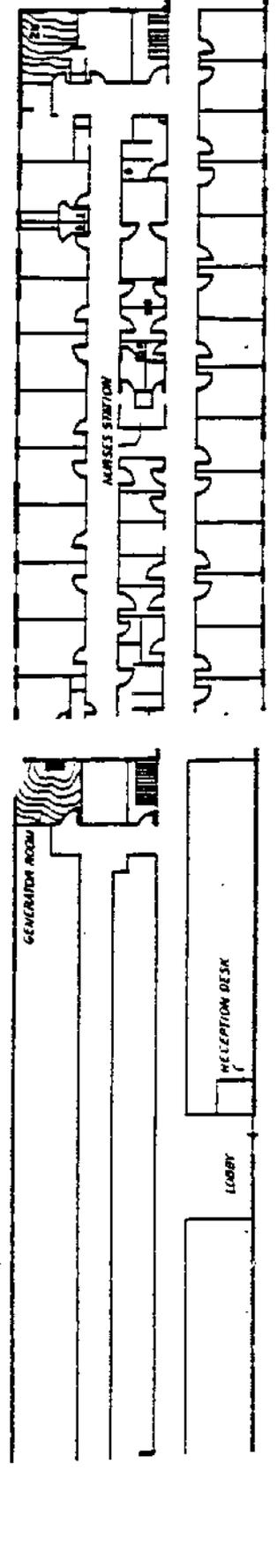
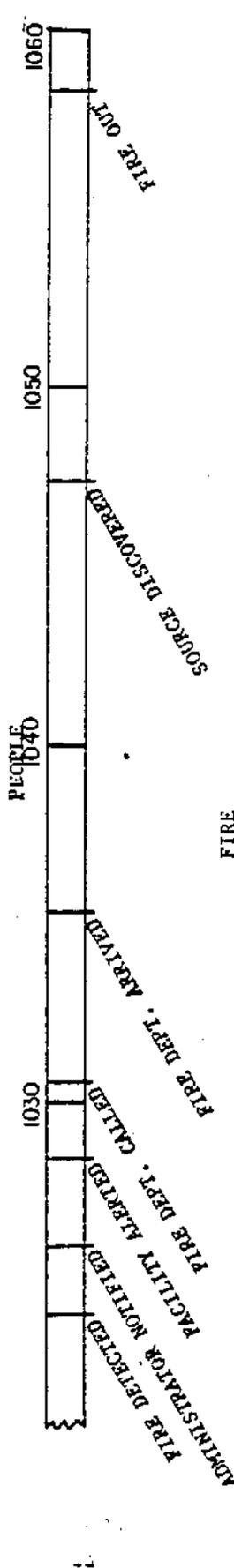
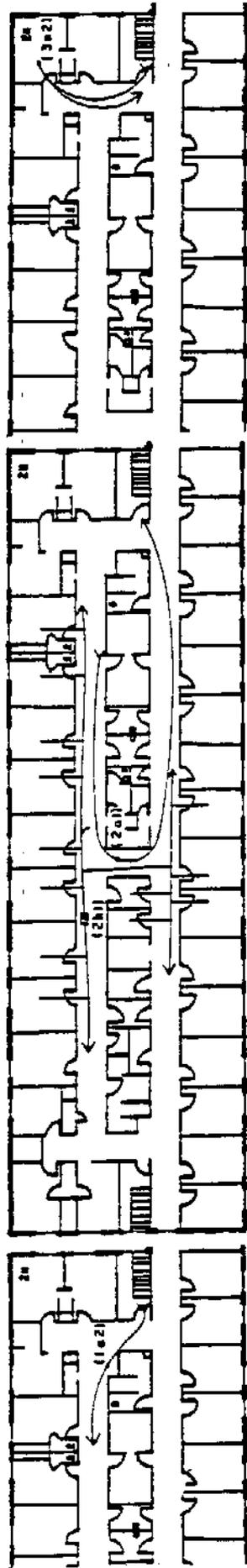
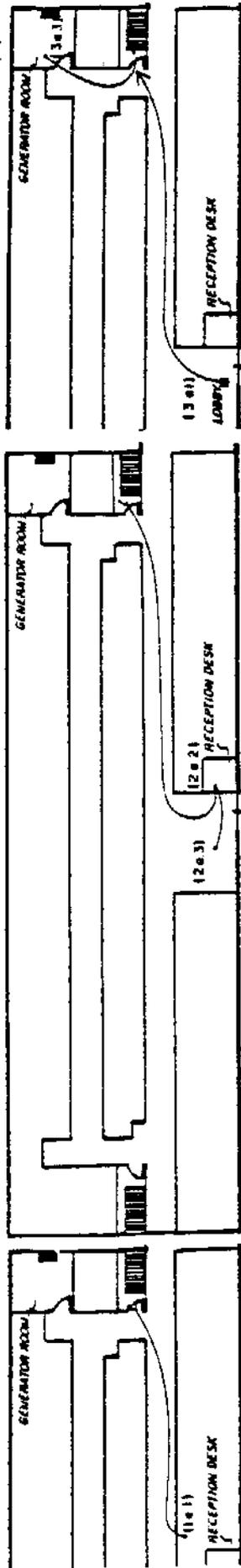
1. The fire reporting procedure of the facility was adhered to in this incident even though the fire incident determination was based on an odor of smoke.
2. Patients were protected from the odor in their rooms on the second floor by the staff action of closing the patient room doors.
3. Thirty patients were evacuated from the third floor by the nursing staff.

B. Fire and Smoke Realms.

1. The smoke barrier doors were activated throughout the facility by the activation of the manual alarm system in the facility.
2. There was not enough smoke density to activate smoke detectors at the smoke barrier doors.
3. The heat intensity was not high enough in the room of fire origin, the generator room, to activate an ordinary rated sprinkler head.

PEOPLE

Realm 1 and Episode 1, 2, 3



12. MANOR CARE, LARGO NURSING HOME, MAY 9, 1978

The fire incident at the Manor Care, Largo Nursing Home on May 9, 1978 was detected by a staff member at approximately 0930. The fire consisted of an odor of smoke, with some light visible smoke emitting from a washing machine in the laundry room on the first floor. The two story building of fire resistive construction was approximately two years old. At the time of the fire incident the facility had a registered occupancy of 100 patients.

The fire was confined to the washing machine by the staff action of disconnecting the electrical power to the machine. The facility local alarm system and public address system coded announcement were not activated.

The fire department was notified and responded. Patients were not moved or evacuated, but retained in rooms with the door closed.

CONCLUSIONS

A. Behavioral Episodes

1. The staff member in the laundry room perceived the odor of smoke and the light smoke emission to be a sufficient cue to initiate the procedural emergency actions.

2. The action of disconnecting the electrical power to the machine involved resulted in eliminating further development and propagation of the fire.

3. The facility emergency procedures were not initiated by the first floor charge nurse. The charge nurse indicated she perceived the fire incident and threat to be of minor consequence and therefore decided not to initiate the facility emergency procedures, including the "Dr. Red" announcement and activation of the local alarm system. (12)

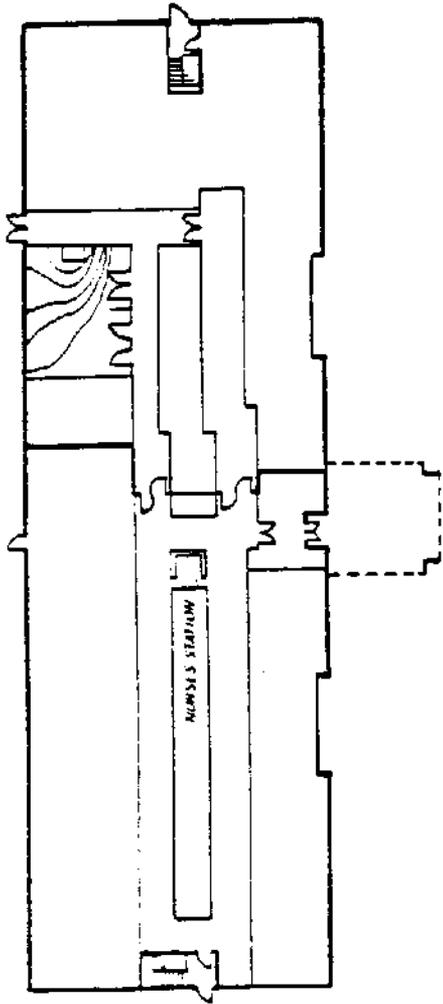
4. The initial staff actions taken in response to the fire incident were conservative in nature. The patients were protected in their rooms by the closing of the patient room doors. Neither patients or staff were exposed to a fire induced environment. No patients were moved or evacuated.

B. Fire and Smoke Realms

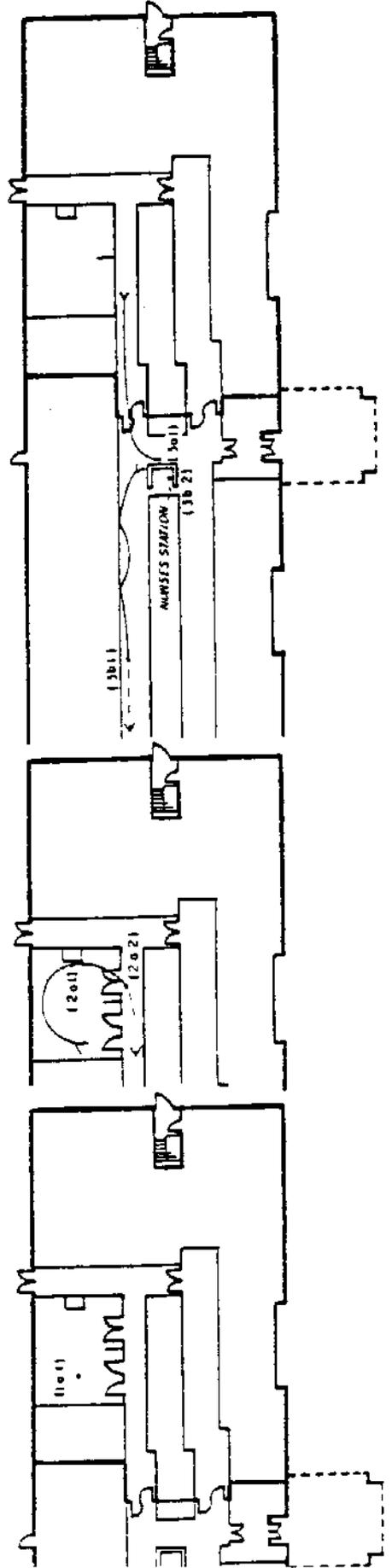
1. The overheating caused by the electrical failure of the motor was stopped by the disconnecting of the electrical power supply to the motor.

2. No smoke detectors or automatic sprinkler heads were activated in this fire incident.

FIRE



PEOPLE



13. AMERICAN NURSING HOME AND CONVALESCENT CENTER, MAY 11, 1978

The fire incident at the American Nursing Home and Convalescent Center on May 11, 1978 was detected by the nursing staff at approximately 1540. The fire at detection involved a polyurethane mattress on an unoccupied bed in patient room 308, the third floor west wing. The three story and basement building of fire resistive construction was erected in 1973. At the time of the fire incident, the building had a registered occupancy of 265 patients. The fire was confined to the mattress of the bed in room 308 and essentially extinguished by nursing personnel with a 6 pound, 2A, 40BC rated extinguisher.

The fire department was notified and responded, with their services being limited to salvage, overhaul and smoke removal. Nine nursing staff including the Director of Nursing, evacuated the approximately twenty-five patients in the fire zone to other areas on the third floor in a two phase evacuation prior to fire department arrival. There were no patient or staff injuries in this fire incident, including the extinguishing operations.

CONCLUSIONS

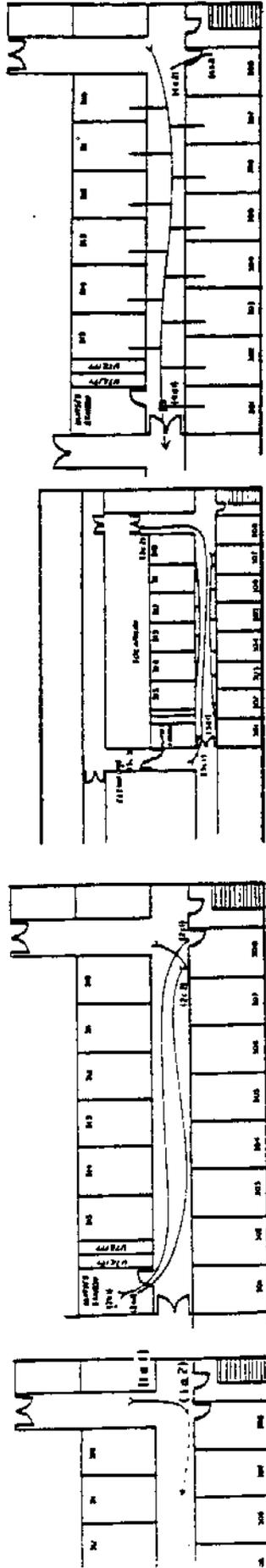
A. Behavioral Episodes

1. The unambiguous nature of the initial detection and visual observation of the flames in this fire incident appeared to initiate an immediate staff response. There was no initial delaying reaction involving investigation, or ambiguity as to the nature of the fire threat.

2. The immediate adaptive behavioral response of closing the door to the room of fire origin, room 308, effectively limited the fire and smoke propagation. This action reduced ventilation to the incipient fire, thus reducing development and providing a human tenable corridor and fire zone environment.

3. The Director of Nursing entered a most hazardous environment to extinguish the fire without concern for her personal safety. She undertook behavior to confine and reduce the fire threat by closing the patient room door after she entered the room to attack the fire. These actions are an indication of the increasingly observed behavior of health care staff personnel conducting procedures to reduce the risk to patients without concern for their personal safety.

PEOPLE



1540

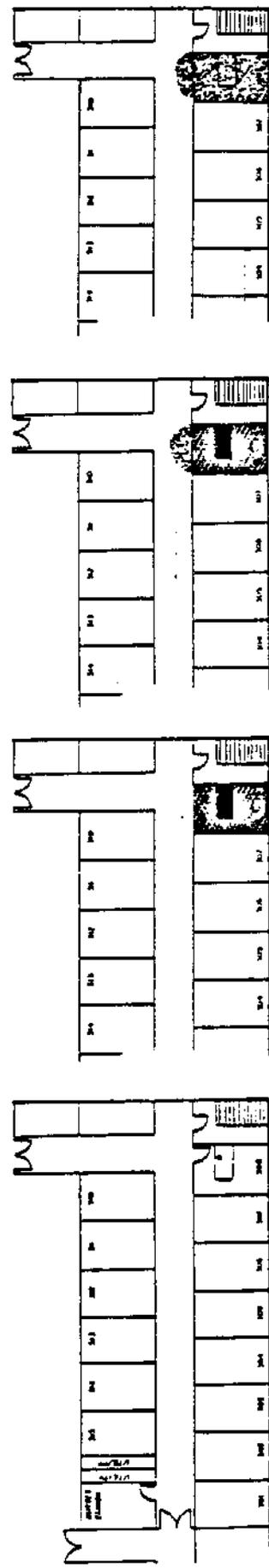
1542

1544

1546

IGNITION DETECTION CHARGE NURSE NOTIFIED
 ALARM PATIENTS MOVED INTO ROOMS, DOORS CLOSED
 EXTINGUISHMENT
 FURTHER EVACUATION OF FIRE ZONE

FIRE



Realms 1, 2 and Episodes 1, 2, 3, 4

4. The Director of Nursing successfully operated the 6 pound all purpose dry chemical extinguisher and effectively extinguished the fire. This procedure was familiar to the nurse due to her previous responsibilities in the facility training program and the training provided by the Prince George's County Fire Department's Bureau of Fire Prevention with instructions and practice with extinguishers.

5. The fire emergency procedures of the facility appeared to be complied with effectively in this fire incident.

6. The adaptive behavioral responses of the nursing staff in isolating the fire in room 308, extinguishing the fire with a portable extinguisher and evacuating the patients, appeared to have been influenced by both training and experience.

B. Fire and Smoke Realms

1. The smoke barrier doors closed upon actuation of the local fire alarm system as designed. These doors were activated when there was insufficient smoke density to activate the smoke detectors located on the ceiling of the corridor at these doors.

2. There was a limited amount of smoke propagated to the corridor, due primarily to the opening of the door to the room of fire origin to enable extinguishment of the fire.

3. It appeared that given the size of the fire at detection, the ventilation control afforded by closing the patient room door may have limited the rate of fire development in this fire incident.

4. The "C" labeled 3/4 hour fire resistance rated patient room doors and the patient room one hour fire resistance rated walls restricted the fire and smoke propagation to room 308.

5. The 6 pound all purpose dry chemical extinguisher was properly charged and operated as designed in the fire incident.

14. ANNE ARUNDEL GENERAL HOSPITAL, MAY 11, 1978

The fire incident at the Anne Arundel General Hospital on May 11, 1978 was detected by a Registered Nurse at approximately 0535. The nurse was summoned to room 414 of "A" building by the patient's call button. The patient requested medication, and the nurse in moving the patient discovered a charred area in the linen one inch in diameter warm to the touch. The eight story building of fire resistive construction was approximately nine years old. At the time of the fire incident the facility had a full patient capacity of 277 patients.

Two patients were evacuated from room 414. There was no visible fire or smoke observed by the staff. The fire involving the charring of the bed linen appeared to have self extinguished. The facility fire emergency procedures were initiated, and the city of Annapolis Fire Department responded.

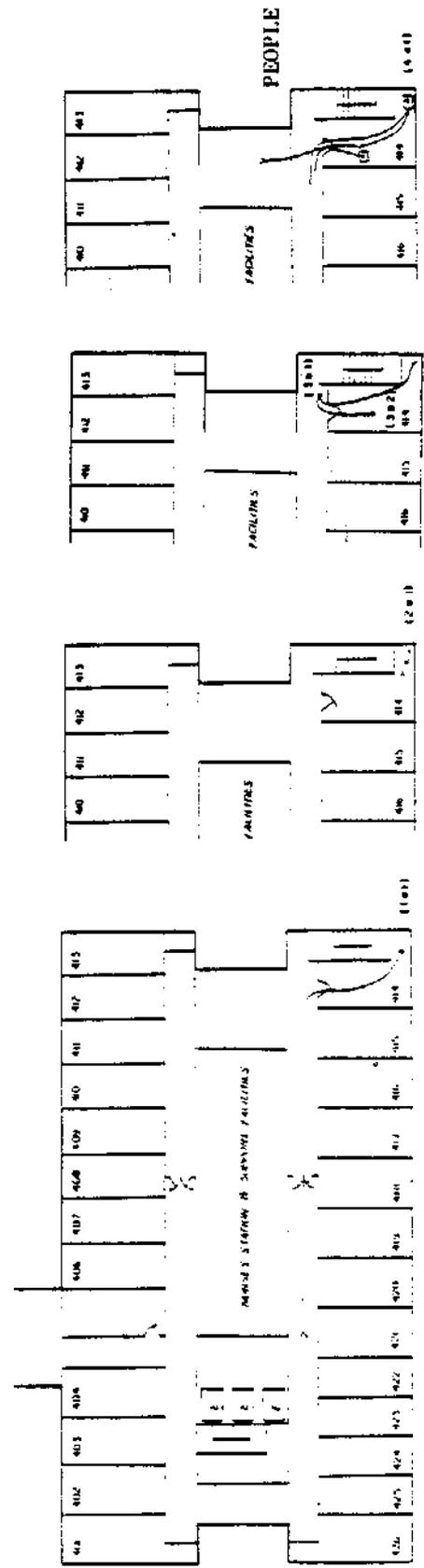
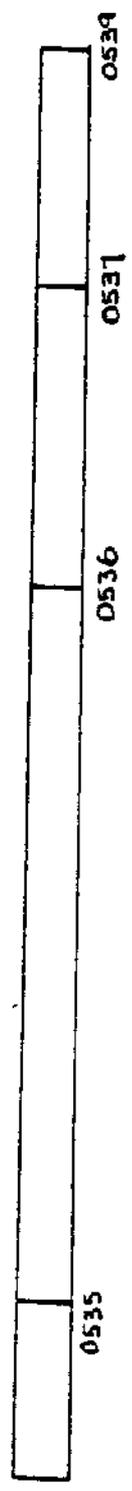
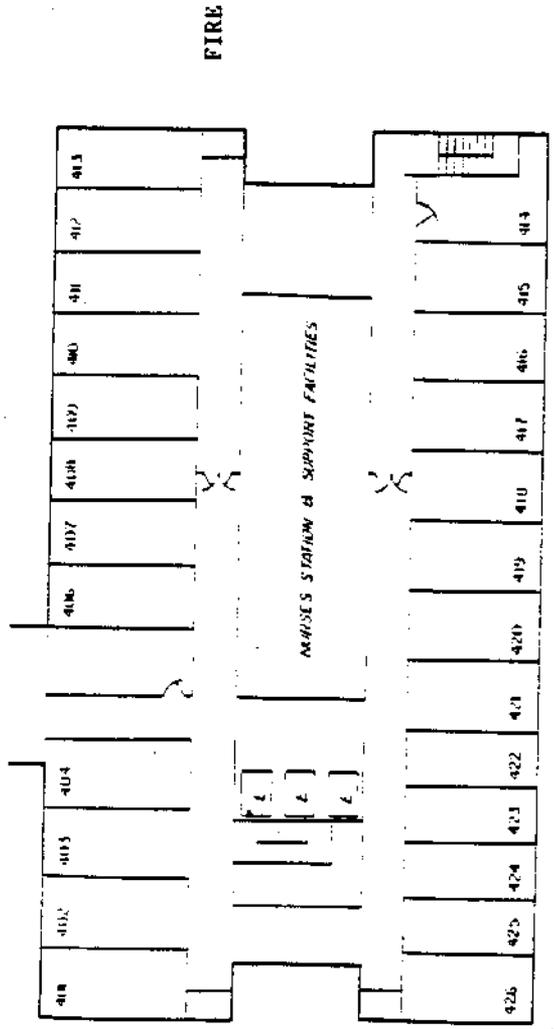
CONCLUSIONS

A. Behavioral Episodes.

1. The adaptive actions initiated by the nurse were performed in an essentially ambient environment, perceived as non threatening to both staff and the patient.
2. The adaptive action of the nurse with the activation of the local alarm system and initiation of the facility fire emergency procedures, appeared to have been determined by the training and frequency of alarms at the facility.
3. The staff of the hospital effectively complied with the facility emergency procedures, and performed as instructed to evacuate the two patients from the patient room of fire origin.

B. Fire Realms

1. There was no change in the ambient environment due to this fire incident. Physically, the area of the fire incident, room 414 was unaltered throughout the fire incident.
2. The smoke barrier doors operated as designed with the closing of the doors upon activation of the local alarm system. (10)



Realm 1 and Episode 1,2,3,4

15. ALLEGANY COUNTY INFIRMARY, MAY 16, 1978

The fire incident at the Allegany County Infirmary on May 16, 1978 was detected by the nursing staff at approximately 0440, at which time the fire consisted of a sweater and robe, fabric materials on the floor of room 112B and fabric materials on a chair held by a patient at the corridor door to room 112B. The two story building of fire resistive construction was thirty years old. At the time of the fire incident, the facility had a registered occupancy of 71 patients.

With the exception of minor burning on a chair held by a patient at the door to room 112B, the fire was confined within room 112B. The patient involved with moving the chair with the fire on it suffered first degree burns to one hand and both legs and feet.

The fire department was notified automatically with the activation of the local fire alarm system within the facility at 0440 through an auxiliary system arrangement with the public fire alarm system. The four nursing staff in the facility evacuated the two nonmobile patients in their beds and extinguished the fire with a 2-1/2 gallon soda and acid extinguisher.

The patients had been evacuated from the room of fire origin, other patient room doors closed and the fire extinguished upon arrival of the first due engine company. The fire department removed the smoke from the facility and performed salvage operations.

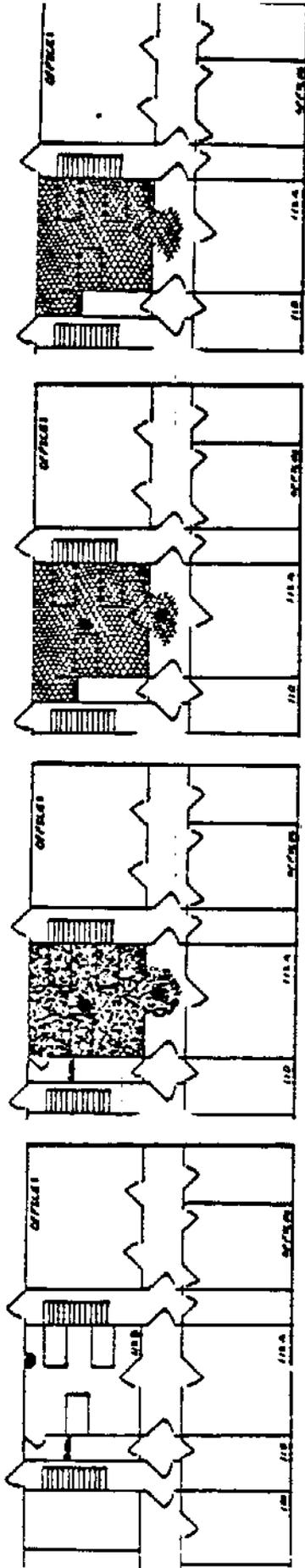
CONCLUSIONS

A. Behavioral Episodes

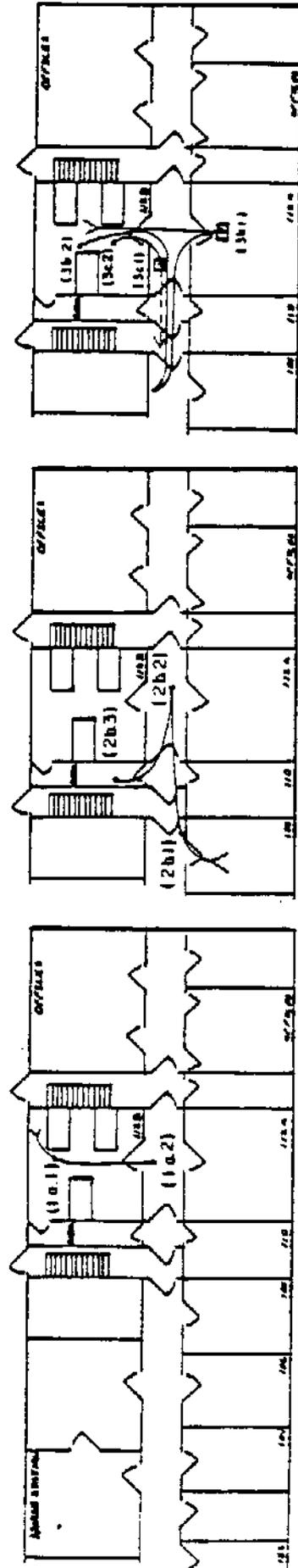
1. The adaptive behavioral response of the nursing staff personnel during this fire incident with a temporal sequence of approximately seven minutes prevented additional patient injuries and reduced the physical and financial loss.

2. The adaptive behavioral response of removing the burning material from the mobile patient and the evacuation of the two nonambulatory patients from room 112B appeared to have been influenced by training, experience and a sincere concern for the safety of the patients in this facility.

FIRE



PEOPLE



Reelms 1, 2, 3, 4, and Episodes 1, 2, 3

3. The behavioral response of the nursing staff in removing the patient under duress from the door of room 112B, to enable the evacuation and extinguishing actions, appeared to have been influenced by both training and experience. These actions were conducted under the threat of physical injury to the staff, and the staff did not appear to have been deterred by this risk.

4. The female nurses assistant who provided the instructions on the operation of the soda and acid fire extinguisher to the male nurses assistant indicated she had attained this knowledge from the verbal, written instructions and experience provided by the City of Cumberland Fire Department.

5. The alarm, evacuation, and extinguishing procedures followed by the nursing staff in this fire incident were in compliance with the emergency procedures of the facility and were effective in the extinguishment of the fire.

B. Fire and Smoke Realms

1. The fire development was confined to the fabric material on the chair and the floor in room 112B, and the corridor adjacent to the entrance door of the room.

2. The smoke barrier doors throughout the facility appeared to function as designed. These doors closed automatically with the activation of the local fire alarm box (9) on the first floor of the facility.

3. The automatic transmission of the alarm from the facility local alarm system to the City of Cumberland street box system with the "master box", auxiliary system arrangement, (11) appeared essential in providing a rapid response of the fire department.

a. It should be noted the recurrent behavior consisting of a tendency to call the fire department even when it has already been notified, as identified by Larup, Greenwood, and Burke (5) did not occur. It is believed this was due to the training of the staff, and their knowledge of the automatic transmission of the alarm.

4. The smoke detectors located on the ceiling of the first floor corridor eight feet from the door to room 112B did not operate prior to the manual activation of the local alarm system.

5. The 2-1/2 gallon soda and acid extinguisher was properly charged and operated as designed in the fire incident.

16. SLIGO GARDENS NURSING HOME, JUNE 10, 1978

The fire incident at the Sligo Gardens Nursing Home on June 10, 1978 was detected by the Second Floor, North Wing charge nurse at approximately 1330. The fire at detection consisted of a flaming power cord to a television set in patient room 228. The two story building of fire resistive construction was approximately ten years old. At the time of the fire incident the building had a registered occupancy to the full capacity of 100 patients.

One patient was evacuated by the nursing staff from the room of fire origin without injury. The fire and smoke propagation was limited to room 228 by the closing of the 3/4 hour fire resistive rated doors. The facility local alarm system was activated, the fire department notified and they responded. The fire had been extinguished prior to fire department arrival by nursing staff with a 5 pound all purpose dry chemical extinguisher.

CONCLUSIONS

A. Behavioral Episodes

1. The charge nurse perceived the fire in the power cord to the television set to be a severe threat to the patient in room 228.

2. The evacuation of the patient from room 228 by the charge nurse prevented any fire incident injuries to the patient.

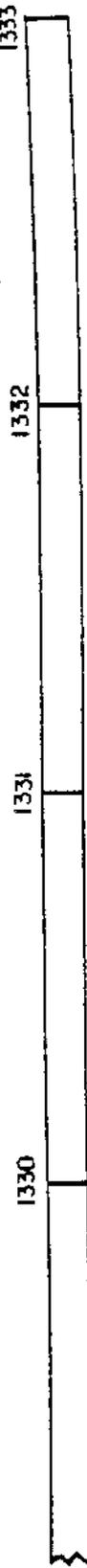
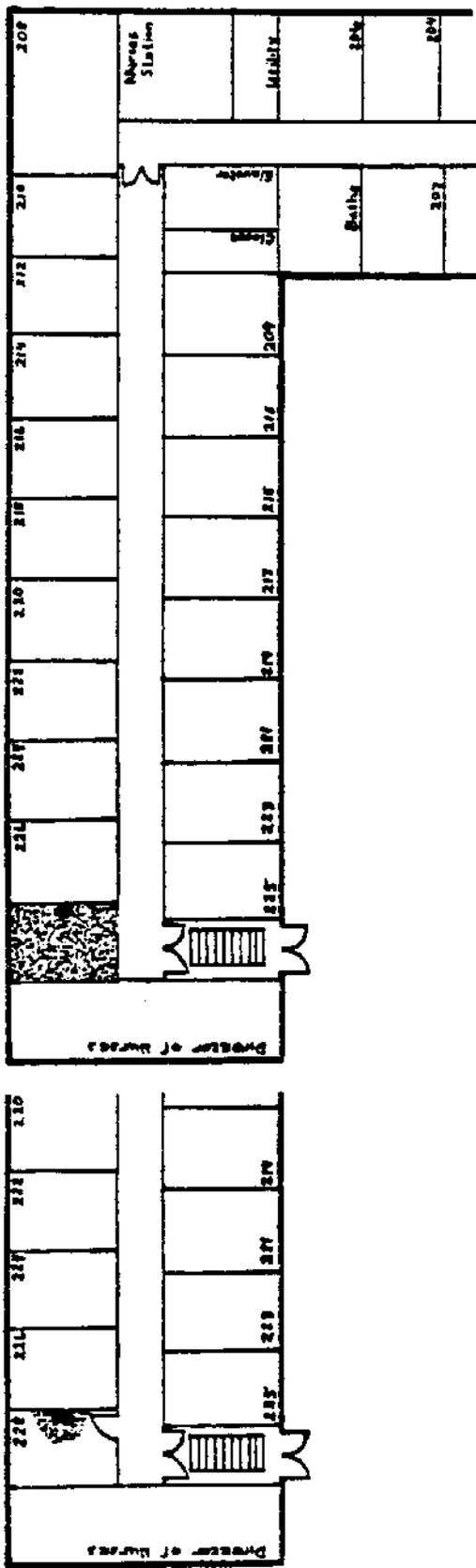
3. The immediate closing of the door to room 228 following evacuation of the patient prevented smoke migration into the corridor.

4. The adaptive behavioral actions of the nursing staff in evacuating the patient, closing the door to room 228, and extinguishing the fire with a 5 pound all purpose dry chemical extinguisher appeared to be the result of facility and fire prevention bureau training.

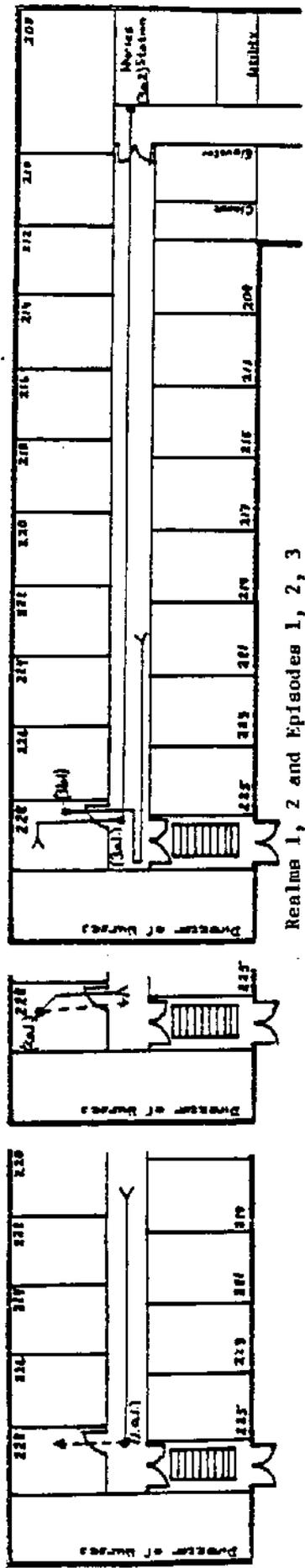
5. The fire emergency and fire reporting procedures of the facility appeared to have been adhered to by the nursing staff in this fire incident.

6. A member of the nursing staff effectively utilized a 5 pound all purpose dry chemical listed extinguisher, (14) rated 2A, 10BC, (13) to extinguish the fire.

FIRE



PEOPLE



Realms 1, 2 and Episodes 1, 2, 3

B. Fire Realms

1. The heat output from the fire in room 228 was not sufficient to actuate any of the ordinary rated pendent sprinkler heads.

2. The local alarm system, (11) operated as designed with the activation of the manual box in the north wing, second floor. The local alarm system activated the closing of the smoke barrier doors throughout the facility as designed in this fire incident.

3. The flaming power cord provided an intense unambiguous cue of the fire incident.

4. The 5 pound all purpose dry chemical extinguisher was properly charged and operated as designed in this fire incident.

17. AVALON MANOR CONVALESCENT CENTER, JUNE 16, 1978

The fire incident at the Avalon Manor Convalescent Center on June 16, 1978 was detected by the nursing staff at approximately 1215. At detection, the fire involved an occupied upholstered chair in the second floor T.V. lounge. The two story building of fire resistive construction is approximately five years old. At the time of the fire incident, the facility had a full capacity of 115 patients.

The facility emergency procedures were initiated and the volunteer fire department automatically notified with the activation of the local alarm system, through a remote station arrangement to their station response siren. The nursing staff initially evacuated eight patients from the area of origin, and a secondary evacuation of approximately thirty patients from the west wing, second floor to the east wing was accomplished. The fire and smoke were confined to the room of origin by the nursing staff closing of the patient room door and the construction.

The fire was extinguished by the facility staff, prior to arrival of the fire department, with a 2½ gallon pressurized water extinguisher and a five pound carbon dioxide extinguisher.

CONCLUSIONS

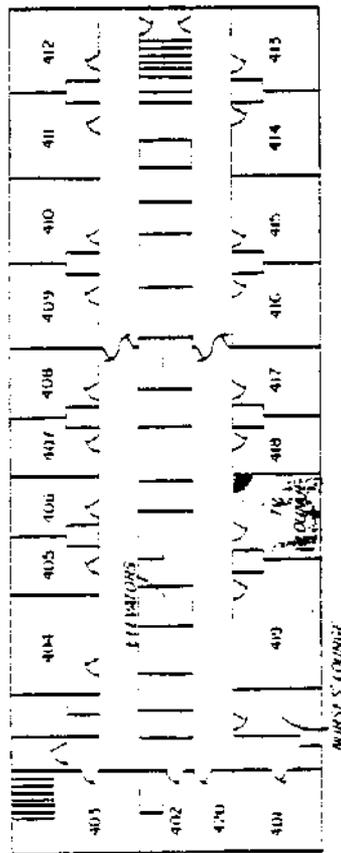
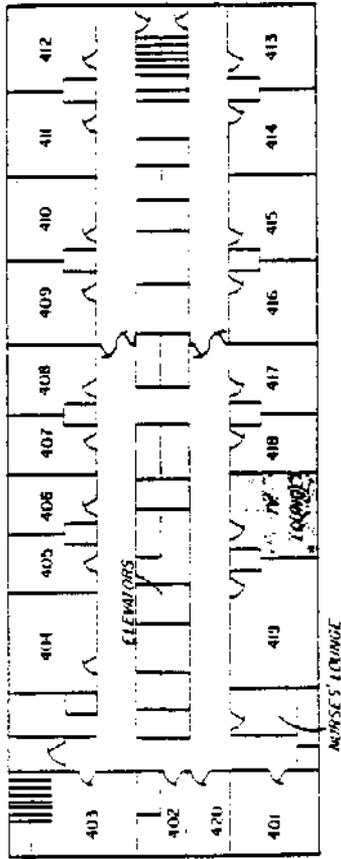
A. Behavioral Episodes

1. The manual fire suppression efforts of the staff personnel were primarily responsible for the prevention of fire development to flashover in the room of origin.

2. The insignificant delay in the activation of the local fire alarm system may have been due to the recent previous alarm experience of the facility. In these previous alarms, a smoke detector activated from a non-fire cause, thus initiating the local fire alarm system.

3. All the components of the facility fire emergency procedures were initiated effectively. The evacuation was conducted effectively prior to the arrival of the fire development.

FIRE

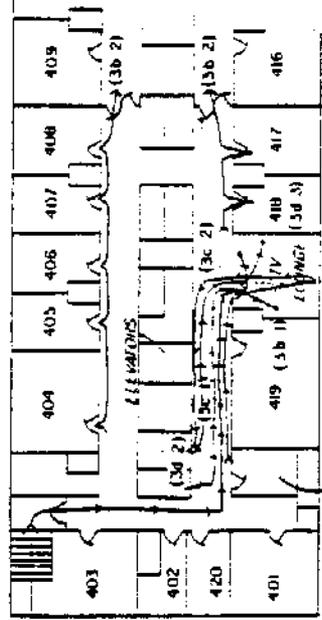
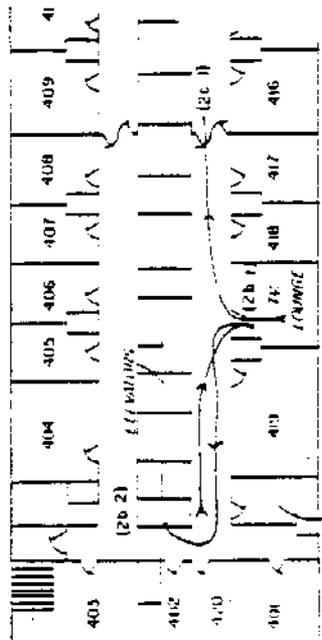
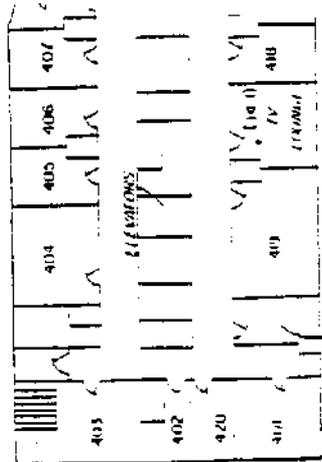


1215

1217

1222

PEOPLE



4. Confidence was expressed by the staff in the detection equipment due to the recent high frequency of smoke detection alarms.

5. The upholstered chair involved in this fire incident was brought into the facility by the family of the blind patient involved in the accidental ignition.

6. The facility staff involved apparently showed no hesitation in subjecting themselves to a hostile, threatening environment during the activities to limit and extinguish the fire.

7. The immediate adaptive action of the nurses aide in removing the blind patient from the chair prevented ignition of the patients clothes and any patient injuries.

8. The successful operation of the extinguishers and the extinguishment of the fire appeared to be related to previous training and practice in extinguisher operation with the cooperation of the fire department.

9. The facility practice of monitoring the smoking activities was demonstrated to be an effective and adaptive procedure.

B. Fire Realms

1. The corridor and room partition system, including the door, successfully limited the smoke propagation to the room of origin.

2. There was no reported detection or sprinkler system operation in the fire incident. The nearest products of combustion smoke detector was located approximately 40 feet from the room of origin in the corridor.

3. Both of the listed (13) extinguishers, the 2½ gallon pressurized water and the five pound carbon dioxide extinguisher, were properly charged and operated as designed.

4. The smoke barrier doors in the facility closed as designed with the activation of the local alarm system. (9)

18. ST. ANNES INFANT HOME, JUNE 20, 1978

The fire incident at the St. Annes Infant Home on June 20, 1978 was detected by the administrator at approximately 2015. The fire at detection involved the overheating of electrical switch gear, which produced a white colored smoke, completely filling the boiler room in the basement. The four story and basement building of fire resistive construction was erected approximately 15 years ago. At the time of the fire incident, the facility had an occupancy of 79 children and 15 mothers. The fire was confined to the overheated electrical switch gear, with no visible flames, and smoke limited to the boiler room, the area of fire origin.

The fire department was notified and responded. No residents were moved within the facility or evacuated from the facility. The staff action in turning off the electrical power, stopped the overheating, and by closing the boiler room door confined the smoke.

CONCLUSIONS

A. Behavioral Episodes

1. The visible smoke in the boiler room was of sufficient density to cause the administrator to notify the fire department. The threat was not perceived as serious enough to initiate the facility emergency procedures.
2. The immediate closing of the boiler room door provided for the confinement of the smoke to the boiler room.
3. The action of the assistant administrator in returning to the boiler room and turning off the electrical power source to the boiler room contributed to the elimination of the overheating of the switchgear.

B. Fire and Smoke Realms

1. The smoke spread was not sufficient enough in the corridor to activate the smoke detectors located in the basement corridors.
2. The electrical overheating of the switchgear did not generate sufficient heat to activate the sprinkler heads located in the boiler room.
3. The smoke spread was confined to the area of fire origin, in the boiler room in the basement.

19. MARYLAND GENERAL HOSPITAL, AUGUST 8, 1978

This fire incident at the Maryland General Hospital on August 8, 1978 was detected by a nurses aide at approximately 0813 hours. The nurses aide detected an odor of smoke in the west corridor of the sixth floor central nursing unit. The nurses aide immediately reported the condition to the patient care coordinator who went to the corridor and observed a light haze of smoke at the ceiling. The patient care coordinator directed the nurses aide to report the fire incident to the facility telephone operator. The security director was also notified by phone and upon arrival activated the local alarm system.(9) Activation of the local alarm system also automatically transmitted an alarm to the Baltimore City Fire Department through an auxiliary system arrangement.(8)

The smoke source was discovered to be a smoldering fire in an ash tray covered with a sheet. Upon staff removal of the sheet and adjacent fuel materials, the fire self-extinguished.

The seven story central hospital building of fire resistive construction was approximately thirteen years old. At the time of the fire incident the sixth floor central nursing unit was at full capacity with thirty-eight patients. The Baltimore City Fire Department responded and verified extinguishment.

CONCLUSIONS

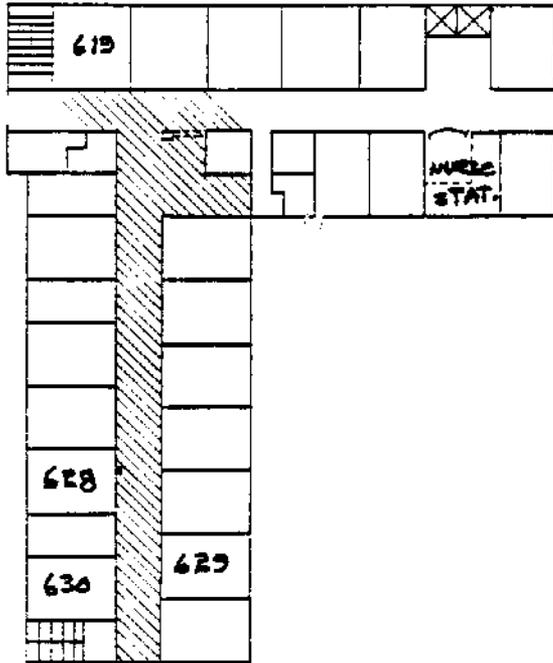
A. Behavioral Episodes.

1. The staff responded to this fire incident in an adaptive manner in accordance with the facility emergency procedures.
2. The initiation of the alarm procedure by the telephone call to the operator appeared to have been predicated on the previous fire reporting procedure of two years ago and had no appreciable effect on the incident.
3. The emergency procedures for the protection of patients and the confining of smoke spread were accomplished effectively and efficiently.

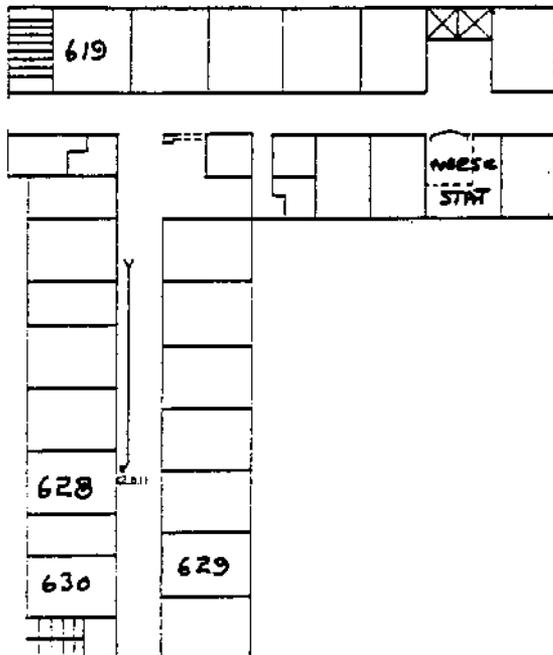
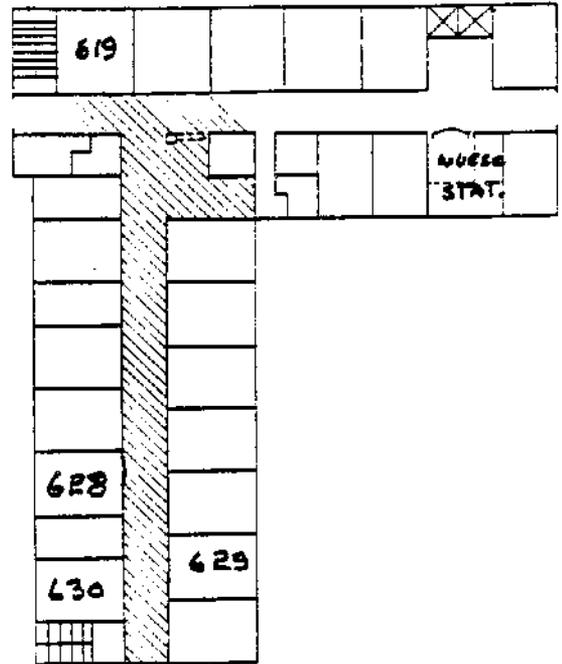
B. Fire and Smoke Realms.

1. The facility local fire alarm system (9) and the automatic fire department notification (8) operated as designed.
2. There was no reported activation of smoke detectors or automatic sprinkler heads.
3. Smoke barrier doors closed as intended upon activation of the local fire alarm system.(9)

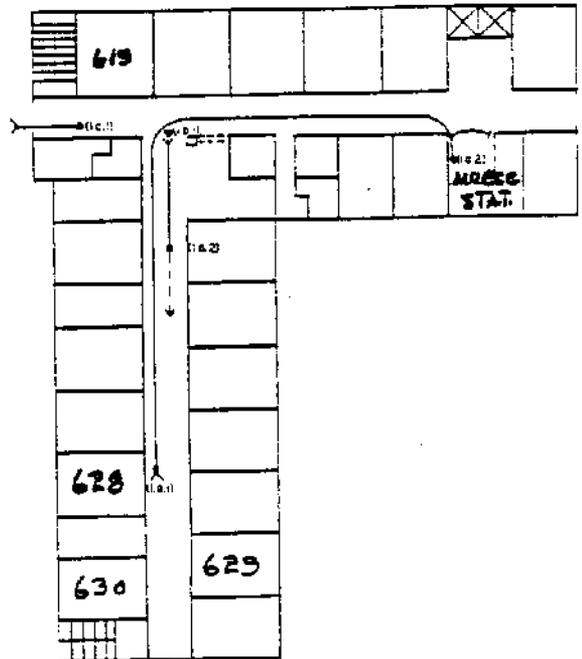
Realms 1, 2 and Episode 1, 2



Fire



People



20. MANOR CARE, LARGO NURSING HOME, AUGUST 14, 1978

The fire incident at the Manor Care, Largo Nursing Home on August 14, 1978 was detected by the maintenance engineer at approximately 1100. The fire at detection consisted of flaming in the flue of the incinerator with smoke propagation to the incinerator room and the first floor corridor of the east wing. The two story building of fire resistive construction was approximately two years old. At the time of the fire incident the building had a registered occupancy of approximately 100 patients.

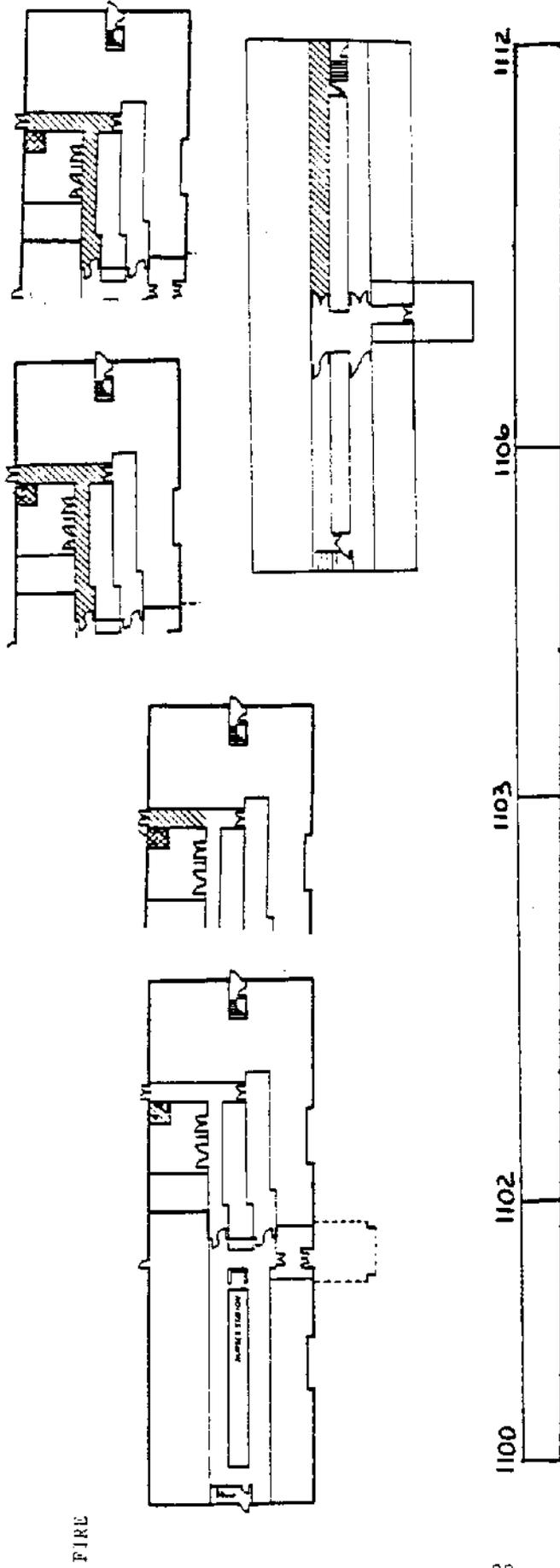
Forty patients were evacuated by the nursing staff from the second floor skilled care area, above the area of fire origin, to the second floor solarium. The fire was contained within the incinerator and extinguished by the maintenance engineer with a 5 pound all purpose dry chemical extinguisher immediately prior to fire department arrival. The smoke spread was confined to the first floor east wing area by the smoke barrier doors, with smoke migration to the second floor east wing through minor openings between the first and second floors.

CONCLUSIONS

A. Behavioral Episodes:

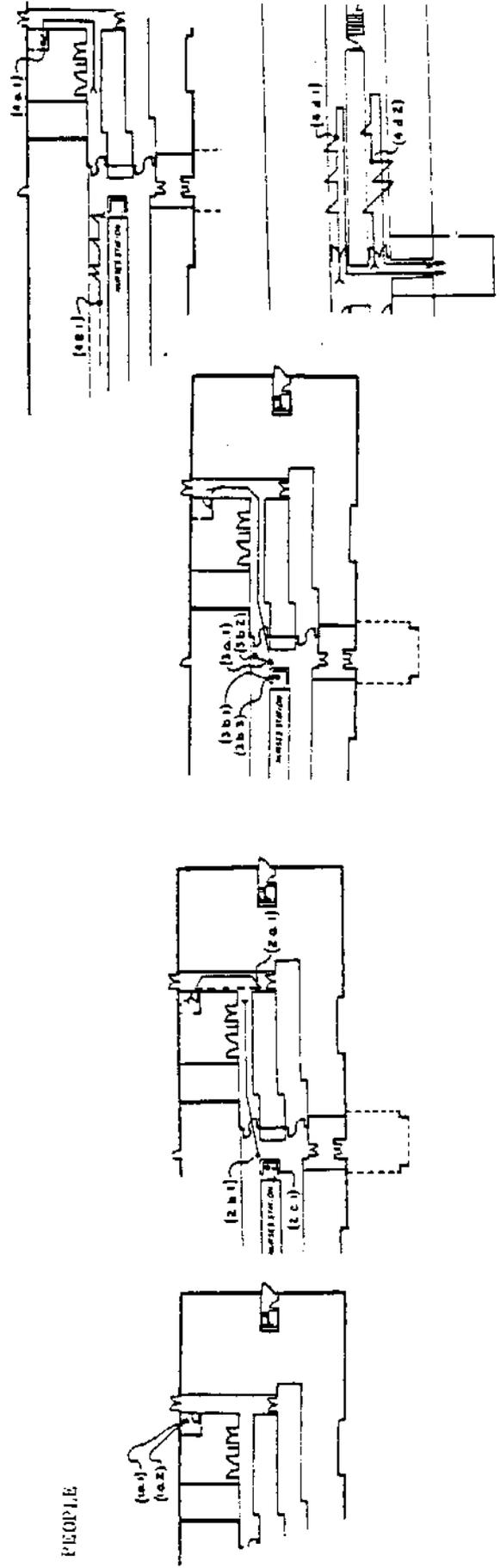
1. The maintenance engineer performed a critical adaptive action in advising the inservice director of the serious smoke threat prior to his successful attempt at extinguishment.
2. The adaptive action of the maintenance engineer in closing the door to the incinerator room restricted and hindered the smoke propagation through the facility.
3. The inservice director did not perceive the initial report of light smoke near the incinerator room as a threat to the facility, and as a precaution, initiated the evacuation of patients from the area above the incinerator room. Upon receiving a secondary, more definitive report, she then perceived a threat situation and initiated the facility fire emergency procedures.

Realm 1, 2 and Episode 1, 2, 3, 4.



FIRE

3



PEOPLE

8. Fire Realms:

1. There was no reported activation of the smoke detectors located at the smoke barrier doors in the fire zone on the first floor.

2. The wet pipe automatic sprinkler system located throughout the fire zone was not activated. The ordinary rated temperature sprinkler heads in the incinerator room did not operate.

3. The local alarm system operated as designed, and initiated the closing of the smoke barrier doors throughout the facility.

4. The smoke barrier doors on the first floor performed as designed, restricting the spread of smoke to the east wing on the first floor.

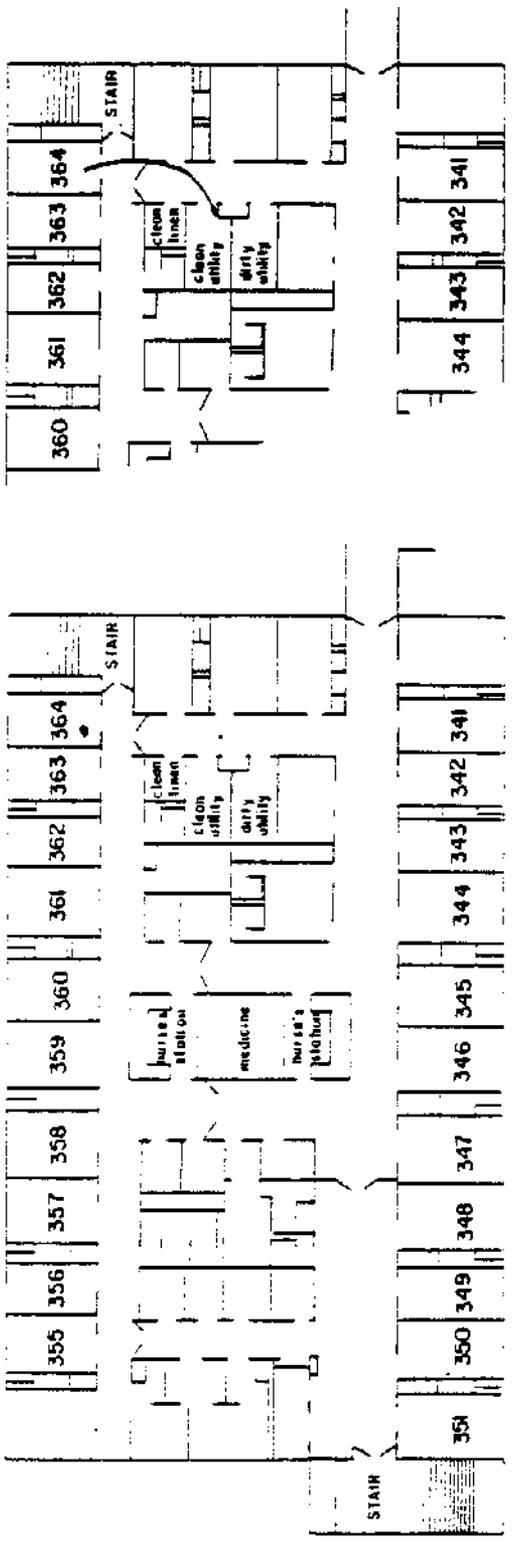
5. The five pound, 2A-60BC rated, (14) and listed, (16) dry chemical extinguisher was charged and operated as designed.

B. Fire Realms.

1. No smoke detectors were activated during this fire incident. Smoke detectors were located at a doorway approximately 20 feet from the room of fire origin, room 364. The patient room door to the corridor was open throughout the temporal sequence of the fire incident.

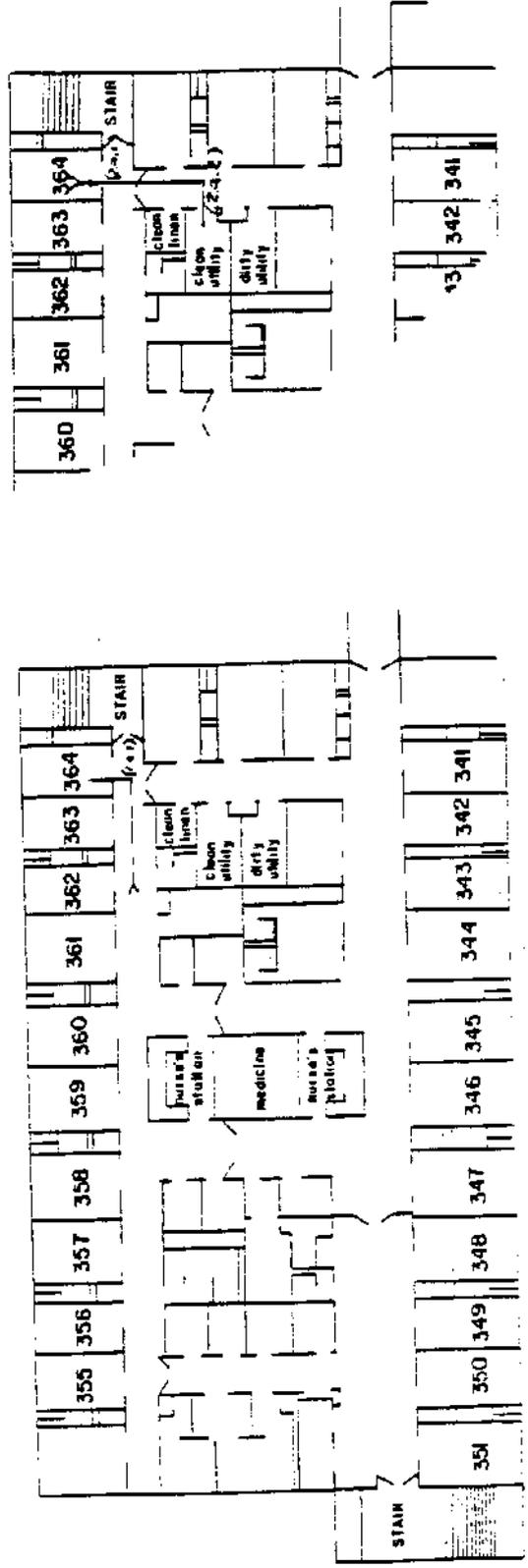
2. The fire remained in a smoldering, incipient state throughout the fire incident, thereby not presenting a severe threat to other patients or the facility.

FIRE



1315

1316 PEOPLE



1317

21. NORTH ARUNDEL HOSPITAL, SEPTEMBER 4, 1978

The fire incident at the North Arundel Hospital on September 4, 1978 was detected by a nurse at approximately 1315. The fire at detection consisted of a smoldering propagation with a char area approximately two inches in diameter on the bedspread and blankets covering a sleeping sedated patient. The building in which the fire zone was located was of fire resistive construction, approximately four years old. At the time of the fire incident the building had a registered occupancy of approximately 285 patients.

No patients were evacuated or moved in this fire incident. The bedding materials involved were removed from the bed and patient, carried to a utility room and extinguished by dousing with water in a sink. The staff and fire department were not notified, no visible smoke spread occurred and there were no staff or patient injuries.

CONCLUSIONS

A. Behavioral Episodes.

1. The fire emergency procedure of this facility was not adhered to in this fire incident since the facility personnel were not notified and the local alarm system (10) was not activated.
2. The immediate removal of the fire threat with the extinguishment of the fire was the critical factor in the decision of the staff not to alert the facility and initiate the facility emergency procedures.
3. The nurse perceived an immediate and severe threat to the patient from the fire involving the linen covering the patient. The nurse apparently perceived no threat to herself during the extinguishment actions.
4. The initial immediate response of the nurse in removing the smoldering linen from the patient was critical in preventing the ignition of the patients clothing and any injury to the patient.
5. The nurse being a part-time employee, had apparently received no additional training in the previous ten months, and reportedly had not participated in the fire emergency drills.

22. MANOR CARE, TOMSON NURSING HOME, OCTOBER 18, 1978

The nursing staff at this nursing home facility were alerted to the occurrence of the fire incident at approximately 1957 hours on October 18, 1978 by an unusual "popping" noise and an odor of smoke. The odor was localized in the area of the second floor nurses station. The patients were immediately moved from the corridors into their rooms and all the patient room doors on the second floor were closed. Upon investigation the source of the smoke odor was identified as the electrical transformer box for the patient call system. The box was internally heated and warm to the touch. No smoke or flames were visible in the fire incident.

Upon identification of the source of the smoke odor the facility emergency procedures were initiated, the local alarm system was activated, the fire department was notified, which responded and disconnected the power to the transformer and verified extinguishment.

The two story fire resistive building was approximately two years old. The capacity of this nursing home was 115 patients, and the facility had a registered population of 109 patients at the time of the fire incident.

CONCLUSIONS

A. Behavioral Episodes.

1. The sequence of the facility emergency plan was not initially followed due to the investigation actions to determine the source of the smoke odor. However, all the components of the plan were initiated with the perception of the smoke odor as a fire threat.

2. Due to the immediate action to place the patients in their rooms and close the doors, the extended investigation for the source of the smoke odor created no additional threat to the patients.

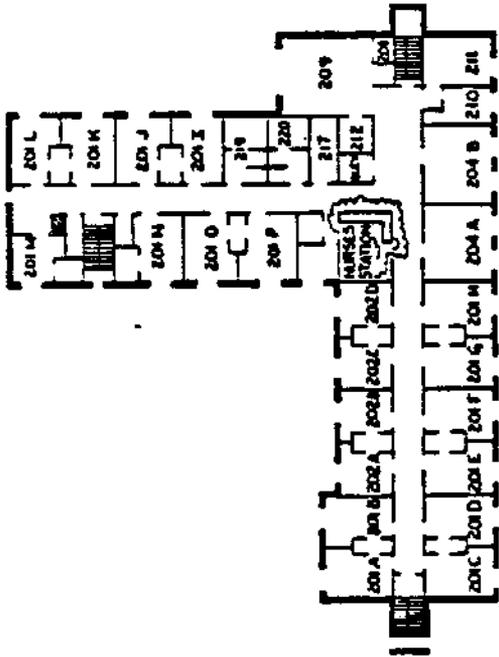
3. The adaptive action of initiation of the facility emergency procedures upon identification of the smoke odor was due to the staff training and threat perception.

B. Fire and Smoke Realms.

1. The smoke barrier doors operated as designed and closed with the operation of the facility local alarm system. (10)

2. The fire realm consisting of the electrical transformer malfunction, essentially did not alter the physical environment of the fire zone on the second floor.

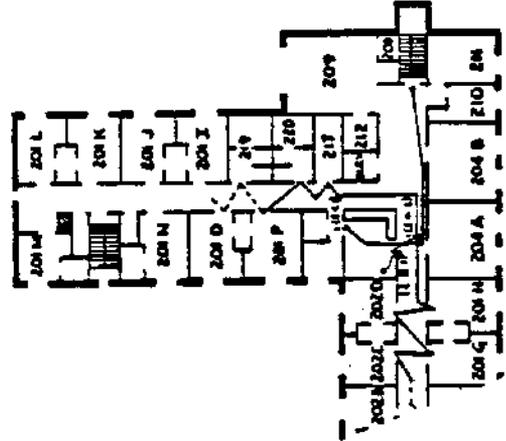
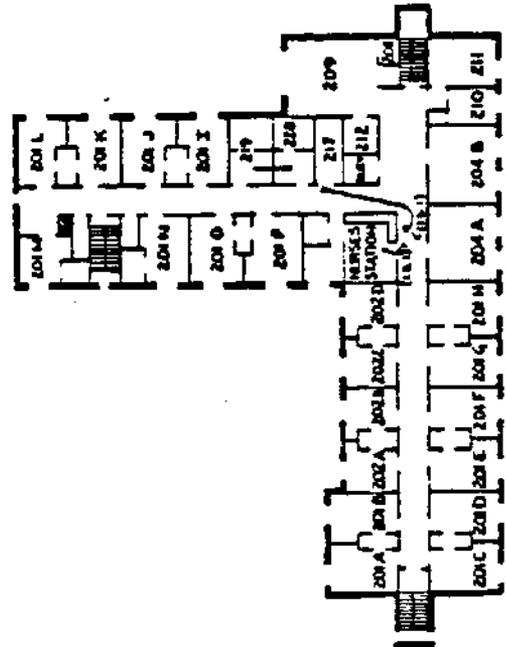
3. There was no reported activation of the smoke detectors or sprinkler heads in the facility.



FIRE



PEOPLE



Realm 1 and Episode 1, 2, 3.

23. LAFAYETTE SQUARE NURSING CENTER, OCTOBER 24, 1978

A staff member observed smoke issuing from the vacant patient room 313 on wing C at approximately 1130 hours on October 24, 1978. The staff member immediately activated the local alarm system and notified the security staff by phone. The security staff initiated the facility fire emergency procedures with the verbal public address system announcement and notified the fire department.

The twenty-two patients on wing C had been moved to allow insect extermination operations that morning so wing 3-C was vacant. None of the 262 patients in the facility were evacuated. The fire was of electrical origin and propagated to the interior void space in the partition wall between patient rooms 311 and 313. The fire was extinguished by staff personnel utilizing six 2 1/2 gallon soda and acid extinguishers and two 10 pound carbon dioxide extinguishers. The Baltimore City Fire Department arrived, verified extinguishment and checked for extension of the fire within the wall.

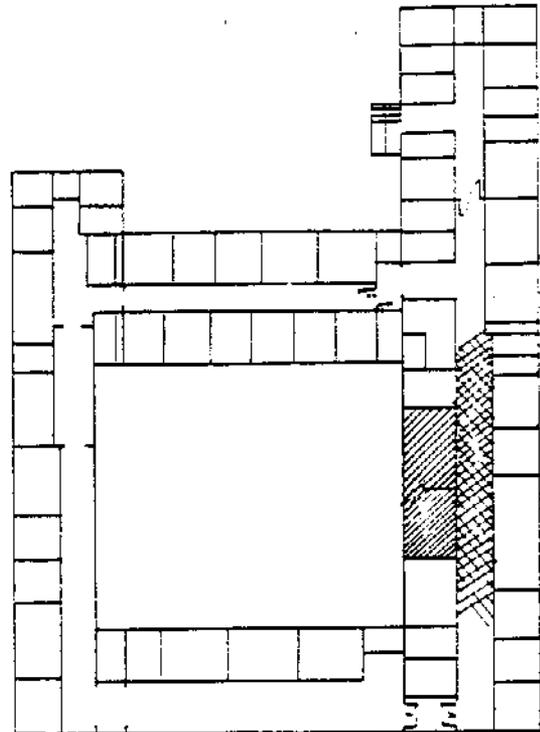
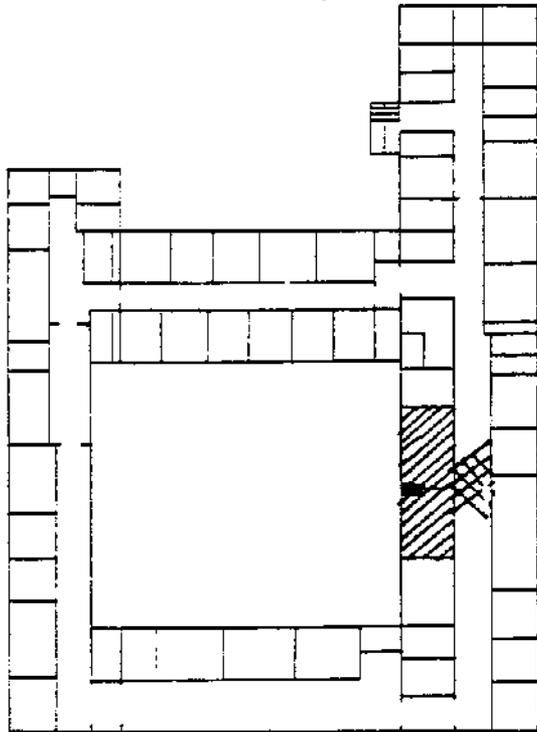
The five story protected ordinary construction and fire resistive construction building was seventy-five years old. The area of fire origin was in the protected ordinary construction section fully protected with automatic sprinklers. The 264 capacity facility had a registered occupancy of 262 patients at the time of the fire incident.

CONCLUSIONS

A. Behavioral Episodes.

1. The staff member detecting the fire incident, perceived the incident as a severe threat and immediately initiated the facility fire emergency procedures.
2. The vacated status of wing C at the time of the fire incident reduced the threat to patients and negated the need for evacuation of patients.
3. The successful extinguishment of the fire by the staff personnel is attributed to the facility and fire department training and to one staff member's previous military experience.

Realm 1, 2 and Episode 1, 2, 3



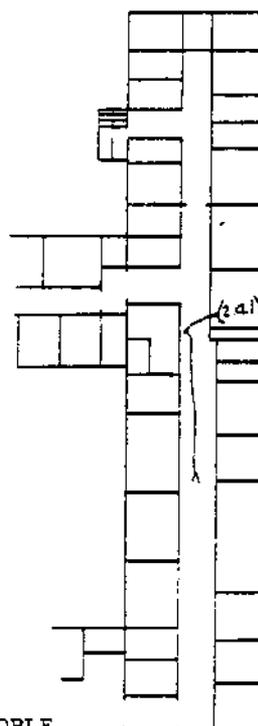
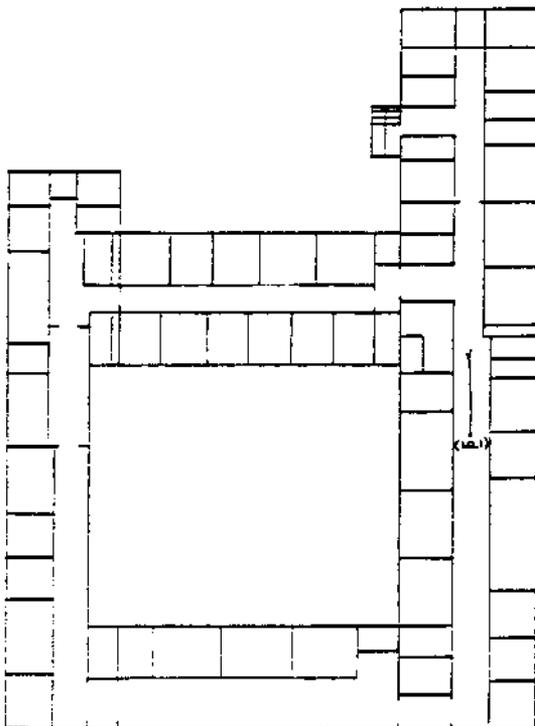
FIRE



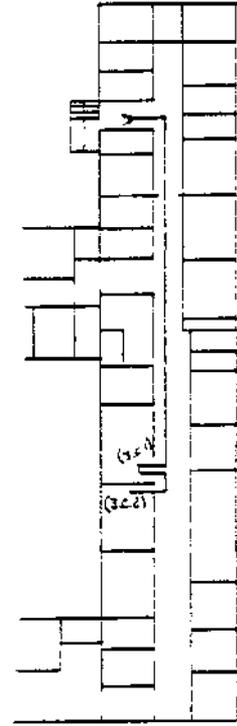
1100

1132

1137



PEOPLE



B. Fire and Smoke Realms.

1. The fire incident, due to the intense and heavy smoke production at detection provided an unambiguous stimulus of a severe fire threat.

2. The listed and rated (14) 1 1/2 hour fire doors in the wing C corridor were effective in preventing the propagation of smoke to adjacent third floor areas.

3. The six, 2 1/2 gallon soda and acid fire extinguishers, rated 2-A, (11) and the two listed (15) 10 pound carbon dioxide extinguishers were properly charged and operated as designed.

4. There was no activation of the automatic sprinkler system in the fire area due to the concealed and protected development of the fire in the interior of the partition wall between patient rooms 311 and 313.

24. SHEPPARD PRATT HOSPITAL, OCTOBER 25-26, 1978

Two fire incidents occurred in this hospital facility on October 25 and 26, 1978. Both fires involved the suspected incendiary ignition of office papers and records on the desk top and the top of file cabinets in Room 327 of "B" Building. Both fire incidents were detected by administrative staff personnel as an odor of smoke. The telephone operator of the facility was notified and the facility "Fire Call" announcement was initiated over the public address system with the location of smoke odor.

The facility fire brigade extinguished the fire on October 25 and the fire department was not notified. A safety officer extinguished the fire on October 26, and the fire department was notified at the request of the safety officer, they responded and verified extinguishment. Both fires were extinguished with six pound all purpose dry chemical extinguishers.

Patient areas were not involved in either fire incident, no personnel evacuated. The four story fire resistive building was approximately 30 years old.

CONCLUSIONS

A. Behavioral Episodes

1. Apparently due to the ambiguous nature of the detection cues, and the reporting of the cues as an "odor of smoke", resulted in staff action prior to initiation of the fire department notification action.

2. The odor of smoke, and the previous fire, Incident One, apparently contributed to the decision of the safety officer to notify the fire department during Incident Two.

3. It appears that no personal threat was perceived by the administrative staff in the fire zone for either fire incident.

4. The successful extinguishment of the fire in both incidents by staff personnel appeared to be related to the prior training of the staff personnel.

B. Fire and Smoke Realms

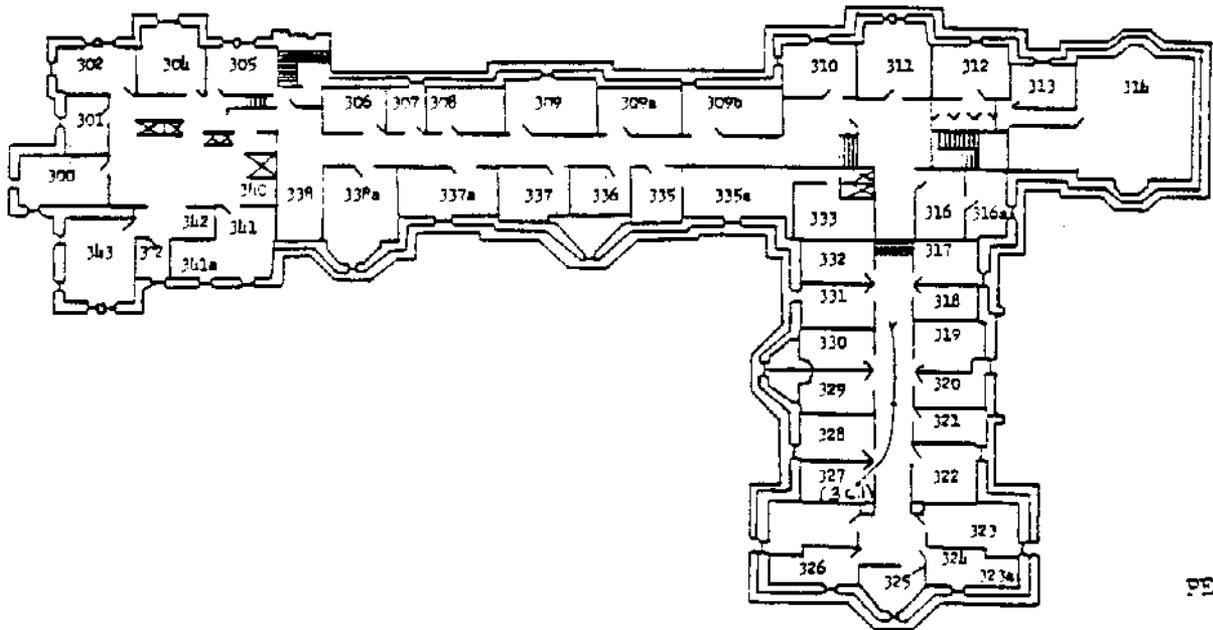
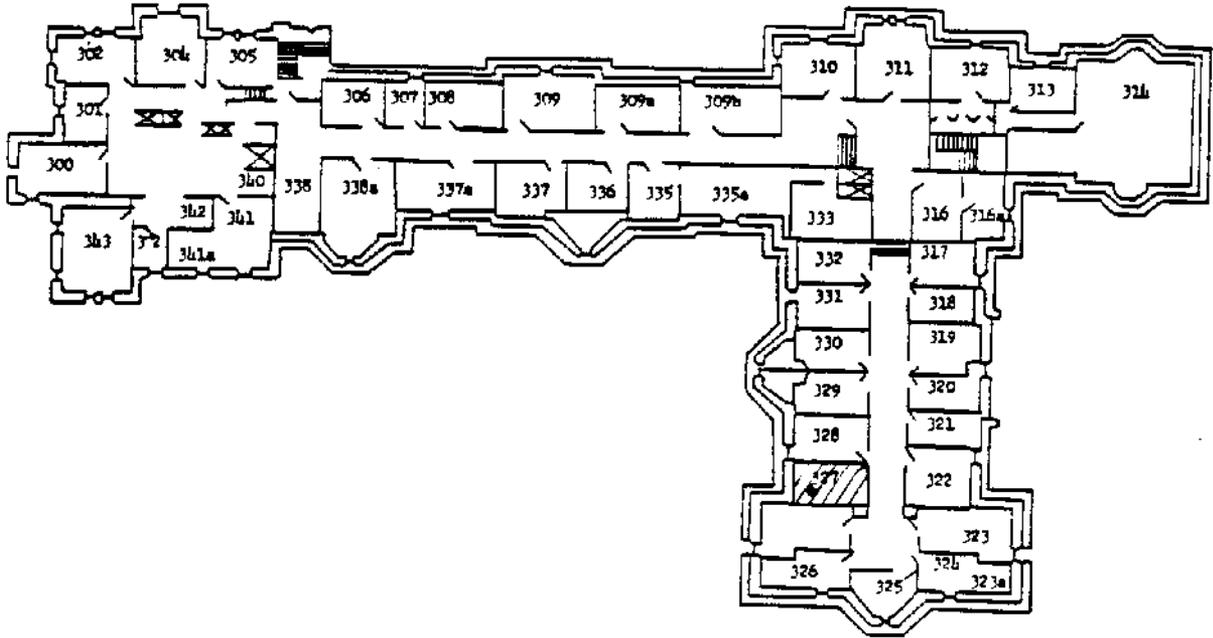
1. There was no reported activation of smoke detector or sprinkler heads in either of these fire incidents.

2. The 14 foot ceiling height contributed to a distorted and reduced perception of the fire and smoke propagation and facilitated the manual suppression efforts.

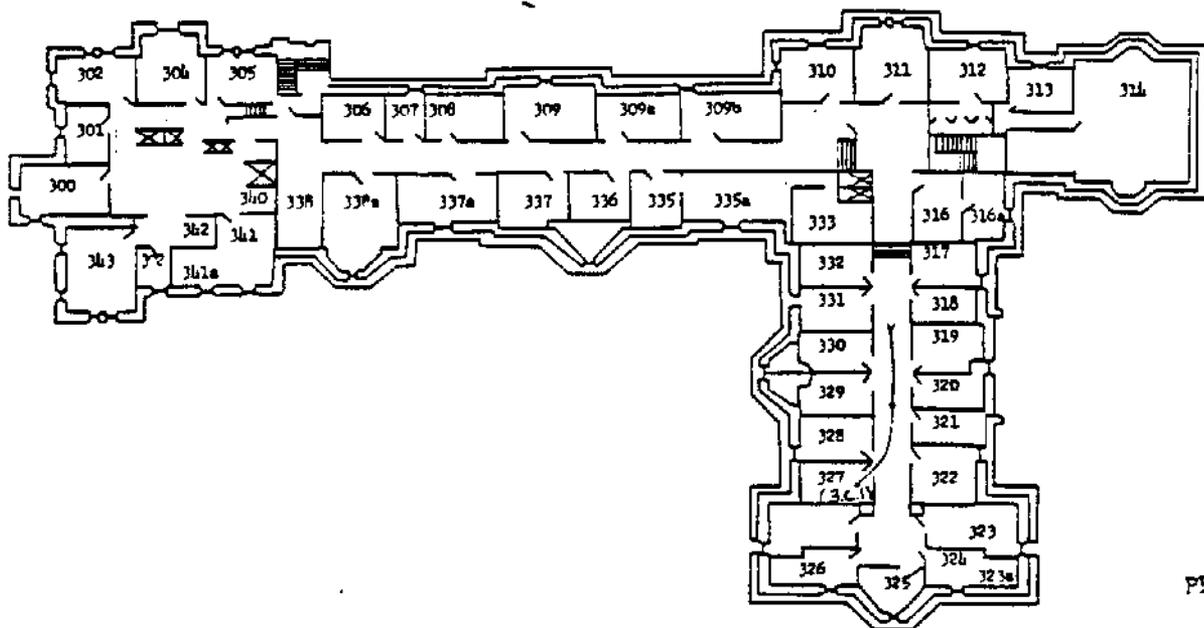
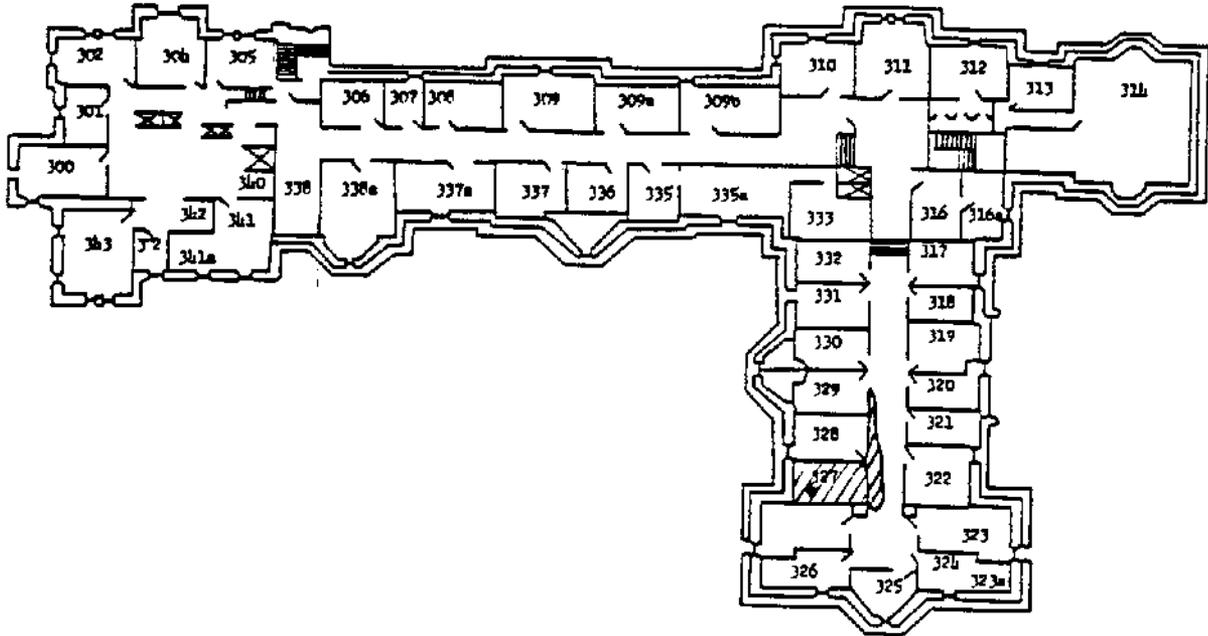
3. There was no appreciable smoke spread outside of the room of origin in either fire incident.

4. The fire extinguishers used in the successful extinguishment of the fire in both incidents, consisting of Listed (17) six pound, all purpose dry chemical extinguishers with a 2A, 10-BC rating (13) were properly maintained, and operated as designed.

Realm 1 and Episode 3. Incident One.



Realm 1 and Episode 3. Incident Two



25. ANNE ARUNDEL GENERAL HOSPITAL, NOVEMBER 14, 1978

The fire incident at the Anne Arundel General Hospital on November 14, 1978 was detected by a nursing assistant at approximately 2015. The nursing assistant entered room 412 of "A" building to prepare the patient for sleeping. The nursing assistant in approaching the patient discovered a charred area completely through the linen one inch in diameter, and a scorched area on the mattress. The eight story building of fire resistive construction was approximately nine years old. At the time of the fire incident the facility had a full patient capacity of 277 patients.

The 77 year old male patient was moved from the bed to a chair in room 412. There was no visible fire, smoke, or smoke odor observed by the staff. The fire involving the charring of the bed linen, and the scorching of the mattress appeared to have self extinguished. The facility fire emergency procedures were initiated, and the city of Annapolis Fire Department responded.

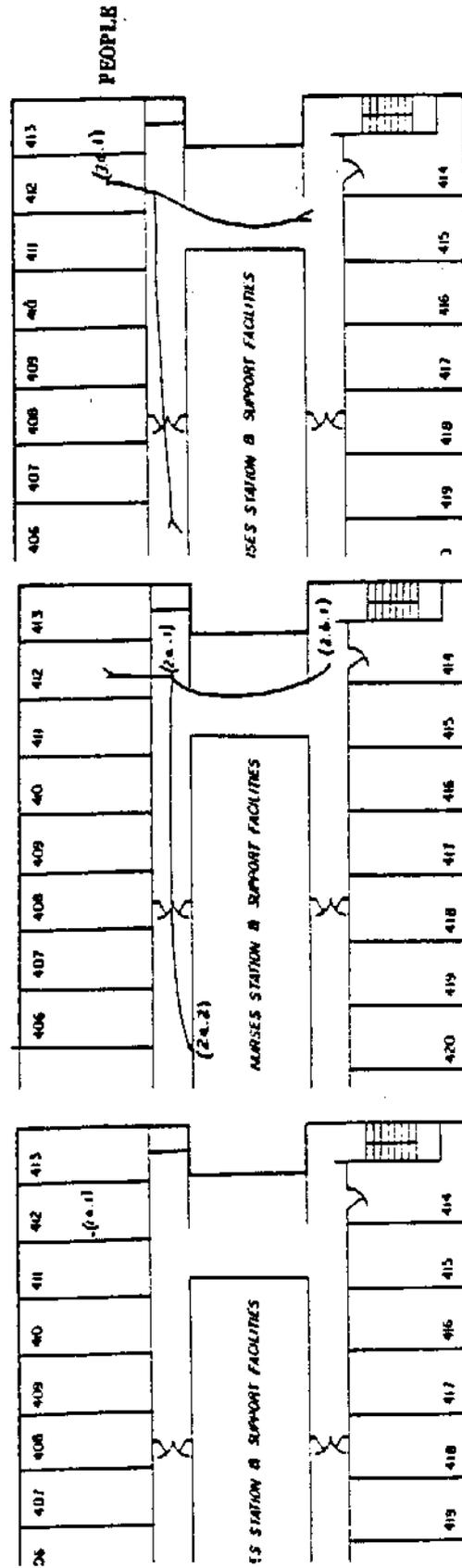
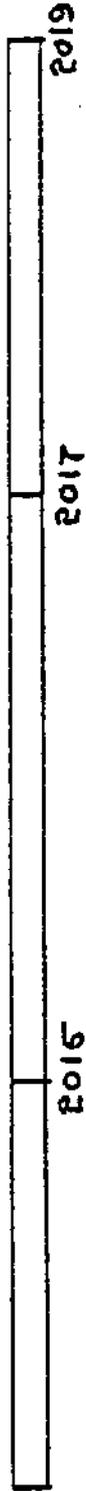
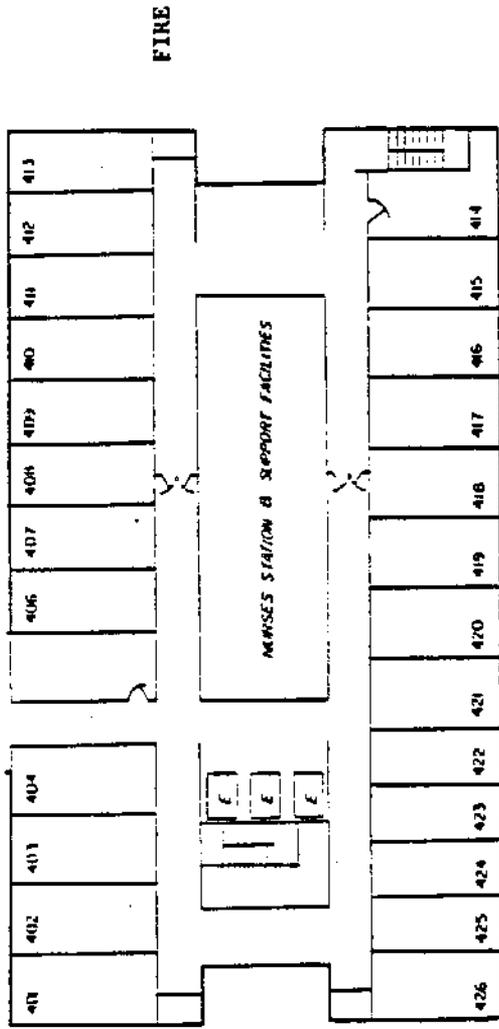
CONCLUSIONS

A. Behavioral Episodes.

1. The adaptive actions initiated by the nurse were performed in an essentially ambient environment, perceived as non threatening to both staff and the patient.
2. The adaptive actions of the nurse following the detection of this fire incident by the nursing assistant appeared to have been determined by the training and frequency of alarms at the facility.
3. The staff of the hospital effectively initiated the facility emergency procedures and performed appropriate threat limiting activities.

B. Fire and Smoke Realms.

1. There was no detectable change in the ambient environment due to this fire incident. Physically, the area of the fire incident, room 412, was unaltered with smoke or odor throughout the incident.
2. The smoke barrier doors, the local fire alarm system, and the facility public address system operated as designed.



Realm 1 and Episodes 1, 2, 3

26. WASHINGTON ADVENTIST HOSPITAL, DECEMBER 9, 1978

This fire incident at the Washington Adventist Hospital on December 9, 1978 was initially detected by a nurses aide in nursing unit 3200 as an odor of smoke in the corridor near the elevator. The nurses aide immediately activated the facility local alarm system (10) at approximately 1047 hours. In accordance with the facility emergency procedures the hospital operator initiated the verbal "Doctor Red" announcement on the public address system and notified the Department of Fire and Rescue Services Communication Center on the direct private phone line.

The nursing staff in the facility placed patients in their rooms and closed the patient room doors. The hospital security staff and the Takoma Park Volunteer Fire Department responded to the nursing unit 3200. Nursing unit 3200 is located on the third floor of the five story and two basement fire resistive building which is approximately twenty-eight years old.

When the source of the smoke odor was not identified on the third floor, an investigative search of the lower floors was initiated. A light haze of smoke was detected outside the ladies locker room, room LL2 on the subbasement level, and a developing fire involving three lockers within the room. The fire department personnel immediately extinguished the fire with one 1-1/2 inch hose line supplied from the building wet standpipe system.(13)

Due to the fire resistive construction of the building, the location of the room of fire origin on the subbasement level, and the immediate suppression action by fire department personnel on the scene,precluded the need for patient evacuation.

CONCLUSIONS

A. Behavioral Episodes.

1. The adaptive action of the nursing staff in immediately activating the local alarm system (10) and initiating the facility emergency procedures upon the detection of ambiguous cues appeared to be the result of previous training and facility policy.

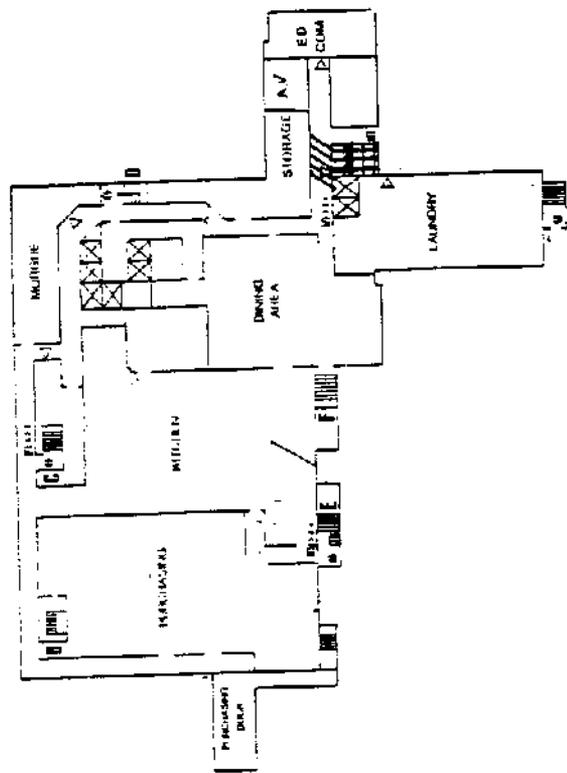
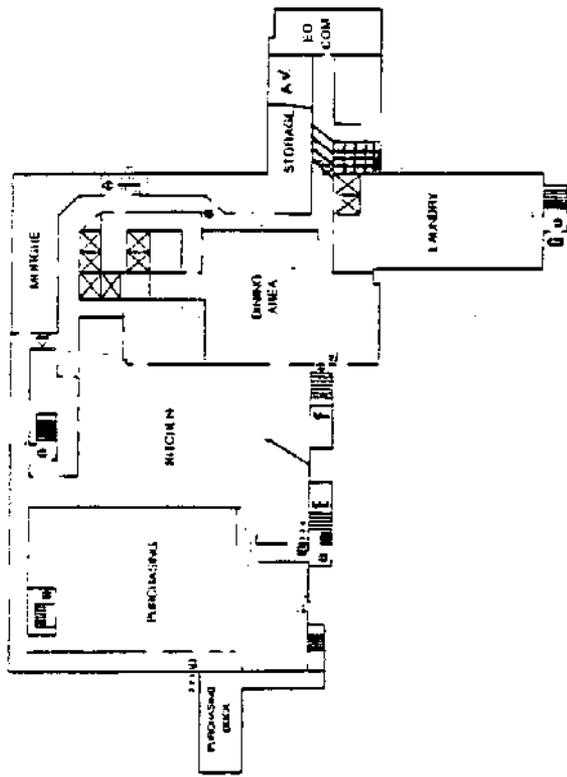
2. The prompt reporting actions of the staff with fire department notification prevented the developing fire in the locker room from propagating into a severe threat to the facility and personnel.

B. Fire and Smoke Realms.

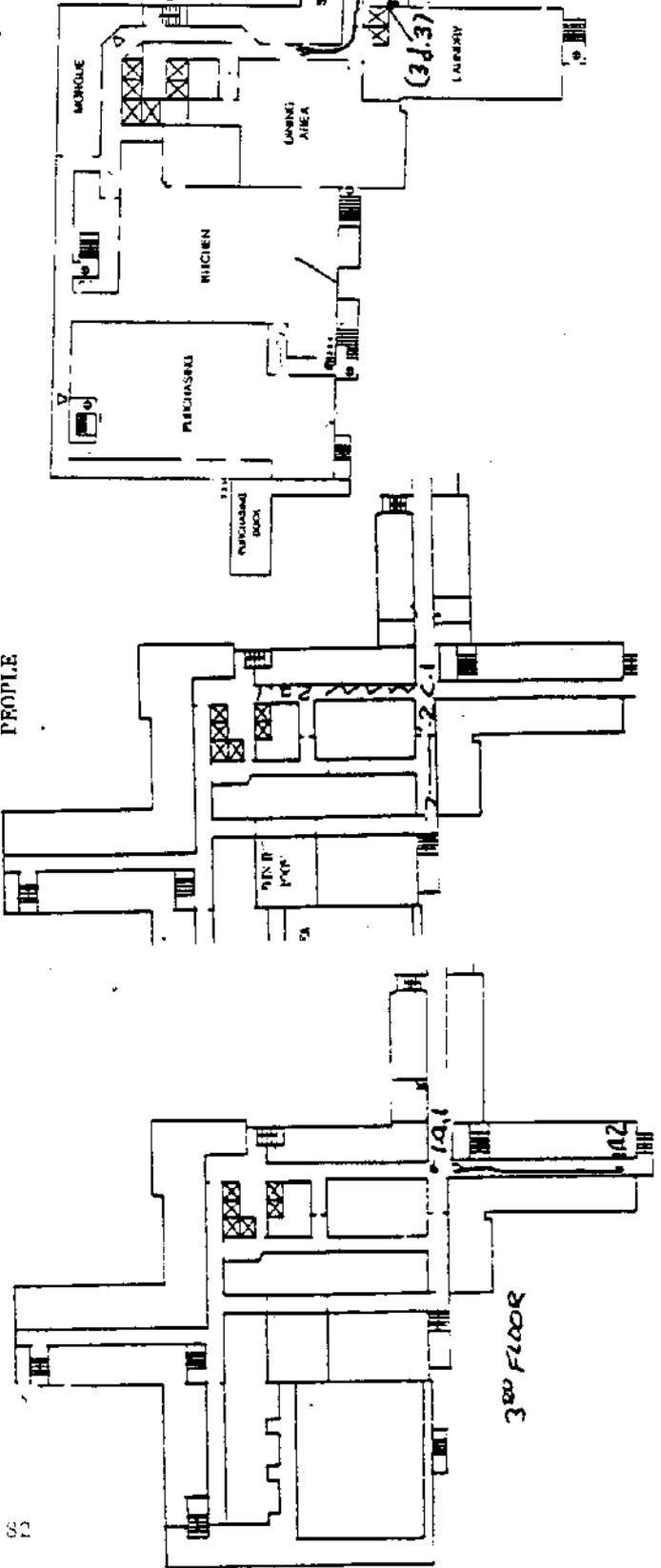
1. There was no reported activation of any smoke detector or automatic sprinkler head in the building.

2. The building wet standpipe system (13) used in conjunction with the fire department 1-1/2" hose line was in proper condition and performed as designed.

3. The smoke barrier doors in the building operated as designed by closing with the activation of the local alarm system. (10)



55



Reams 1, 2 and Episodes 1, 2, 3.

27. SPRING GROVE HOSPITAL CENTER, DECEMBER 14, 1978

A secretary on Ward A of the White Building at the Spring Grove Hospital Center on December 14, 1978 at approximately 1205 detected an odor of smoke. The odor was localized in the corridor in the South West portion of the building. The secretary notified the telephone operator, who sent maintenance personnel to the building to locate the source of the smoke odor. Since the smoke odor persisted the secretary called the safety officer. The safety officer immediately notified the telephone operator who initiated the facility emergency procedures and notified the fire department.

The White Building was evacuated of approximately 120 patients and 12 nursing staff. The safety officer located the source of the smoke odor from a fluorescent light ballast in an office. The Baltimore County Fire Department arrived, verified extinguishment and removed residues of the smoke.

The one story, fire resistive building was approximately twenty years old. This is one building at this residential regional mental hospital center consisting of twenty-two buildings with a total capacity of 1,484 patients.

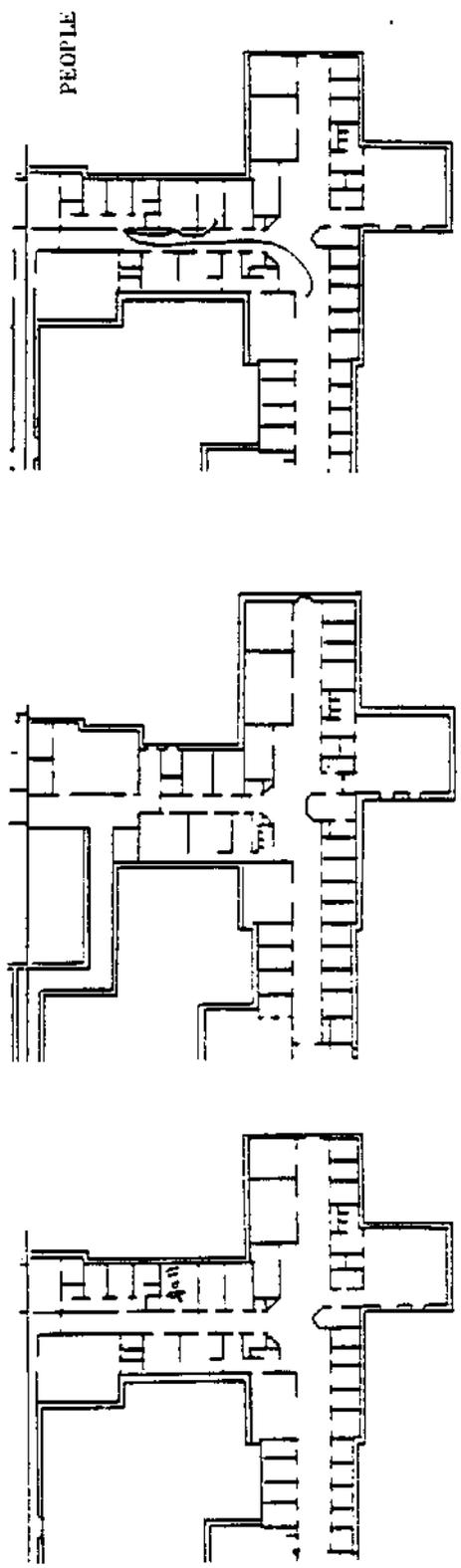
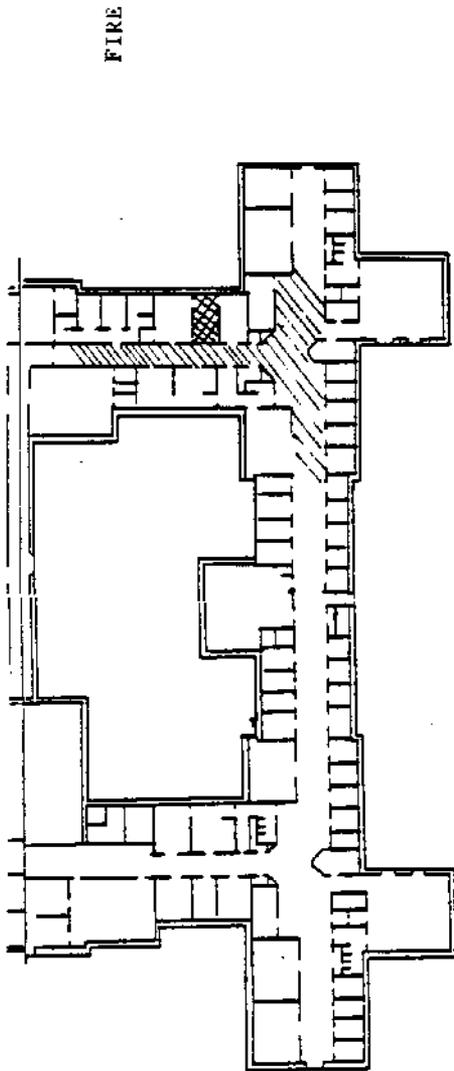
CONCLUSIONS

A. Behavioral Episodes.

1. The initial response to the detection of the smoke odor consisted of an investigative procedure by maintenance personnel in an attempt to determine the source of the smoke odor and assess the condition of risk or threat. This response appeared to have been predicated by several variables:
 - a. The ambiguous nature of the smoke odor cues.
 - b. The lack of threat or risk perception to the definition of the smoke odor, primarily due to the lack of visible smoke.
2. The decision to alert the facility and notify the fire department was predicated on the persistence of the smoke odor, and followed the facility emergency procedure.
3. The total effective evacuation of the building appeared due to staff training and experience.

B. Fire and Smoke Realms.

1. The one hour fire resistive separation between the corridor and room of fire origin was effective in containing the smoke spread.
2. There was no reported activation of the smoke detectors located in the corridor at the smoke barrier doors.



Realm 1 and Episodes 1, 2, 3

28. WASHINGTON ADVENTIST HOSPITAL, DECEMBER 22, 1978

The fire incident at the Washington Adventist Hospital on December 22, 1978 was detected by a staff employee at approximately 1028. The fire at detection consisted of a plastic food tray, with plastic containers and paper combustibles on an energized hot plate in the clean utility room of nursing unit 2200 on the second floor. At detection, flames had achieved a height of approximately 24 inches and a dense black layer of smoke had accumulated 18 inches in depth at the ceiling of the room of origin.

The six story building of fire resistive construction was approximately twenty-eight years old. At the time of the fire incident this hospital had a registered occupancy of 360 patients.

Two patients were evacuated from the corridor adjacent to the room of origin, and one patient from a room across the corridor by the nursing staff.

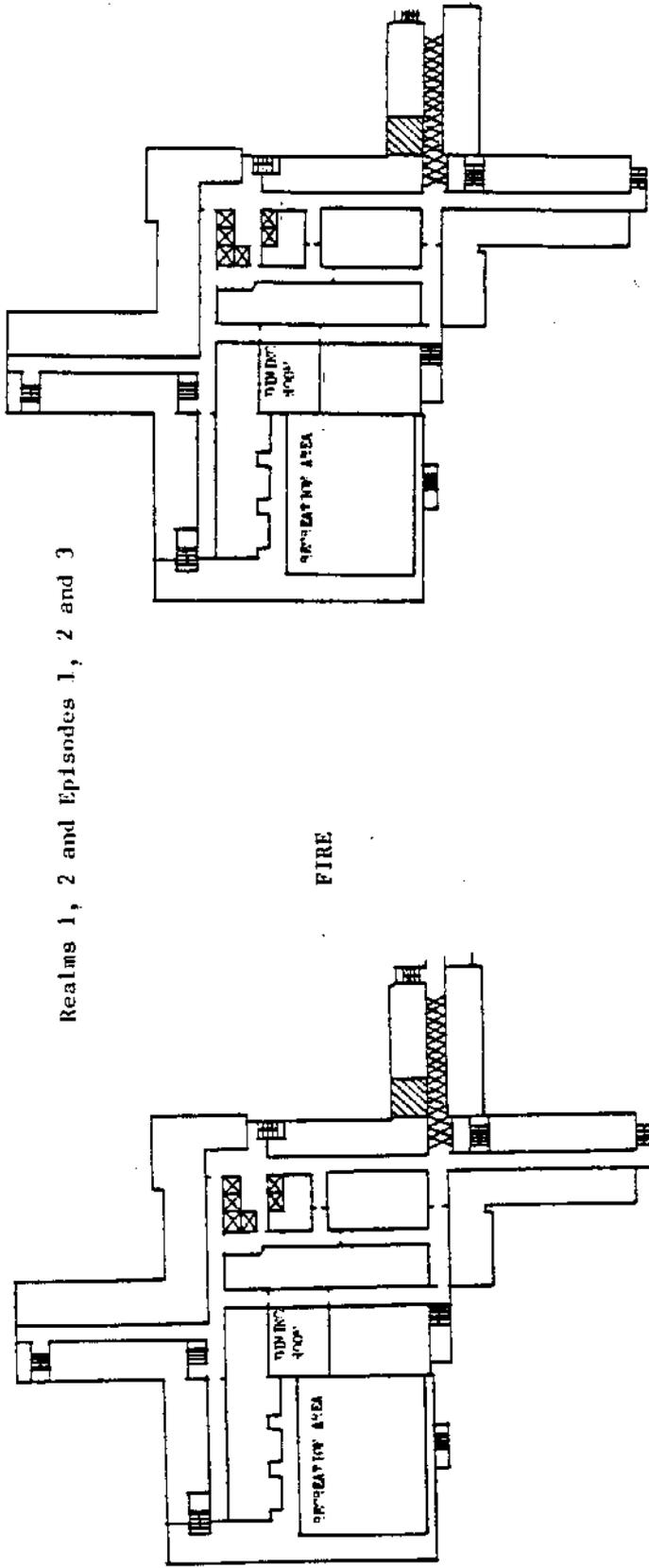
The fire and smoke propagation was limited to the clean utility room by the closing of the 20 minute fire resistive rated door. The hospital local alarm system was activated, the hospital fire brigade and the fire department were notified. The fire was extinguished by a physician and nursing staff personnel with a pitcher of ice water and a 2 1/2 gallon pressurized water extinguisher prior to fire department arrival. The fire department verified extinguishment and conducted overhaul and ventilation operations.

VII. CONCLUSIONS

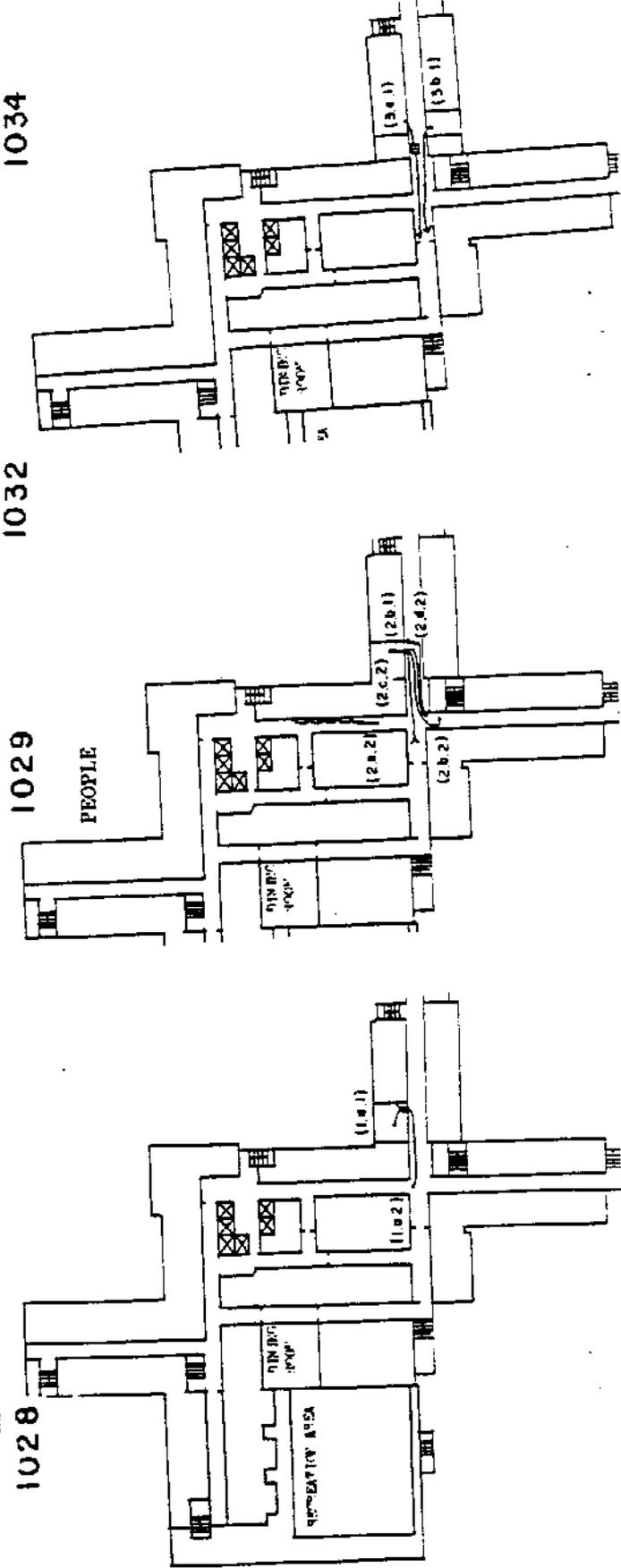
A. Behavioral Episodes.

1. The Central Services staff member who detected the fire incident initiated two essential adaptive actions which appeared effective in reducing the threat from this fire incident.
 - a. The immediate closing of the clean utility room door confined the smoke to the area of origin and tended to retard the fire development.
 - b. The immediate reporting of the observed flames and visible smoke to the nursing staff resulted in time being available for the staff extinguishing actions.
2. The response and actions of the nursing staff to the verbal report of the fire detection was in conformance with the facility emergency procedures, with the activation of the local alarm system, the closing of patient room doors, and the evacuation of the two patients in the corridor.

Realms 1, 2 and Episodes 1, 2 and 3



1028 1029 1032 1034



3. The physician utilizing the available pitcher with ice and water effectively suppressed the flames, while the physicians assistant using the 2 1/2 gallon listed (12) pressurized water, rated 2-A, (10) extinguisher completed the extinguishment.

- a. The effective operation of the pressurized water extinguisher was reported to be a result of both facility and fire department training.
- b. Some staff members reportedly expressed concern over the application of the class A (10) pressurized water extinguisher to what they perceived to be a class C (10) fire condition with the energized hot plate.

4. The asthmatic patient in the room across the corridor was evacuated as a precautionary procedure due to his medical condition as a result of the concern of the nursing staff.

B. Fire and Smoke Realms.

1. The smoke propagation was primarily confined to the room of origin, the clean utility room due to the integrity of fire resistive construction and the adaptive action of immediately closing the room door.

2. The smoke barrier doors operated as designed and closed automatically with the activation of the local alarm system. (8)

3. The simultaneous activation of two manual boxes on the local alarm system reportedly resulted in an invalid coded audible signal. However, correct indication was received with annunciators, and both hospital fire brigade and fire department personnel were notified of the correct location with no delay. The facility fire reporting procedures were effectively complied with and initiated.

4. The 2 1/2 gallon, listed (12) pressurized water, rated 2-A (10) extinguisher was properly maintained and operated as designed.

5. There was no activation of the smoke detectors in the corridors or automatic sprinkler heads in hazardous areas.

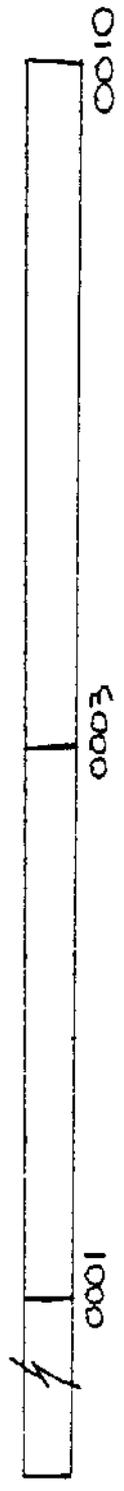
29. SOUTHERN MARYLAND HOSPITAL CENTER, JANUARY 2, 1979

The fire incident at the Southern Maryland Hospital Center on January 2, 1979 was detected by a patient at approximately 0001 hours. The male patient in the psychiatric care unit on the fourth floor, west wing, reported to a nurse at the nurses station there was an odor of smoke in the south corridor outside the closed door of vacant patient room 414. The nurse immediately initiated the facility fire emergency procedures with a phone call to the facility telephone operator. The telephone operator alerted the facility with a verbal "Code Red" announcement over the public address system and phoned the Prince George's County Fire Communications Center on the "911" emergency number.

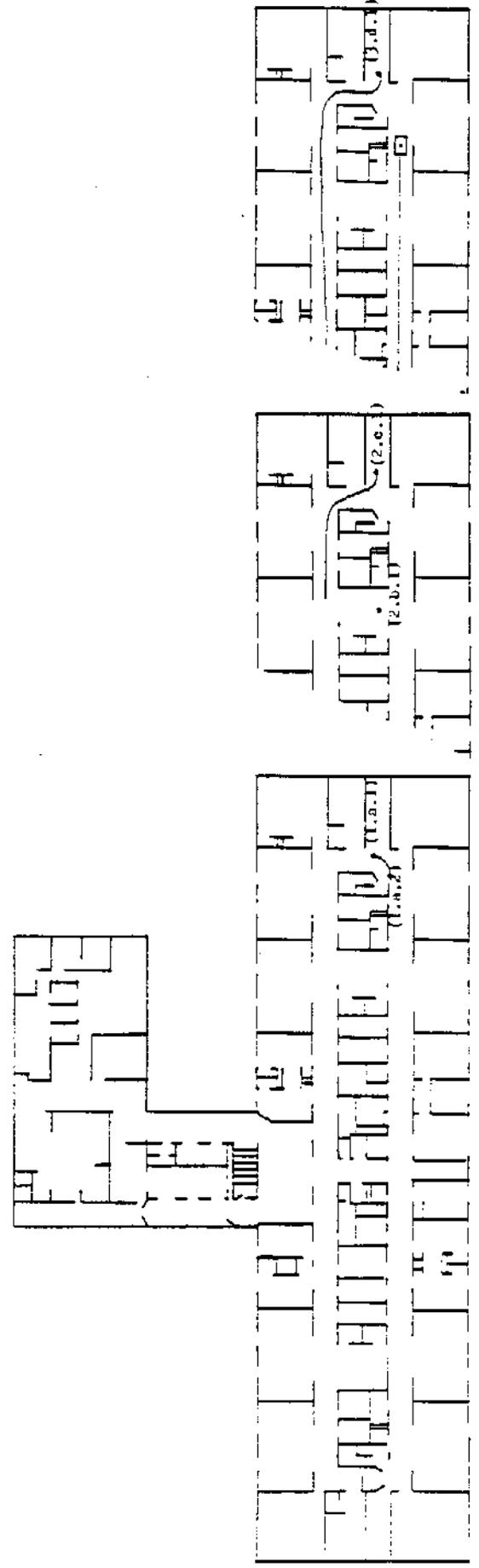
The fire in a fiber glass waste container was extinguished by a male psychiatric patient using a 10 pound, listed (15) all purpose dry chemical extinguisher, rated 5A, 60B, C. (11) The smoke propagation was heavy in room 414, and moderate in the south corridor of the fourth floor, west wing. The smoke was confined to the west wing area by the smoke barrier doors. The smoke detector system in the psychiatric care unit, including room 414, activated immediately following extinguishment. The seventeen patients in the psychiatric care unit were all ambulatory and were evacuated to the fourth floor, east wing, following extinguishment for the duration of the night.

The five and two story building of fire resistive construction was approximately thirteen months old. At the time of the fire incident, the 300 bed capacity facility had seventeen patients in the twenty-five bed capacity psychiatric unit.

The Clinton Volunteer Fire Department responded with other Prince George's County units, verified extinguishment, and performed smoke removal and ventilation operations on the fourth floor.



28



Realm 1, 2 and Episode 1, 2, 3

CONCLUSIONS

A. Behavioral Episodes.

1. The notification procedures of the facility fire reporting procedures were modified in this fire incident by the non-activation of the local alarm system (9) immediately.
 - a. However, the nursing staff personnel receiving the initial report from a psychiatric patient, immediately perceive the threat as severe and initiated the emergency procedures with a phone call to the facility operator.
2. The procedure in a facility of this size of providing nursing staff personnel as a fire department guide appeared to be most effective.
3. The facility emergency procedures of closing patient room doors was followed efficiently. The action of ambulatory patients subsequently leaving their rooms in the fire zone apparently also occurred.
4. The adaptive action of the male patient in extinguishing the fire in the fiberglass waste container in the patient room 414 was critical in reducing the threat in this fire incident.
5. The internal communication confusion created by the use of the blue code phone for the fire report, and the delayed operation of the local alarm system (9) had no effect on the favorable outcome of this fire incident due to the adaptive actions of facility personnel.

B. Fire and Smoke Realms.

1. The delayed activation of the smoke detection system in the fourth floor West wing contributed to some communication confusion.
2. The automatic door closing devices and the smoke barrier doors operated as designed with the smoke detectors activation of the local alarm system.(9)
3. The 10 pound, listed (15) all purpose dry chemical extinguisher, rated 5A, 60BC (11) was properly charged and operated as designed.
4. Due to the security needs and provisions for the psychiatric care unit, some delay was experienced in ventilating the smoke from the area.

30. GEORGIAN TOWERS APARTMENTS, JANUARY 9, 1979

This fire incident at the Georgian Towers Apartment Complex, 8750 Georgia Avenue, Silver Spring, Maryland on January 9, 1979 was initially detected by the occupant of apartment 214 when he was awakened with his mattress on fire. The occupant attempted to remove the mattress from the apartment and being unsuccessful ran down four levels to the desk receptionist to call the fire department. The fire department received the alarm at 0246.

The corridor door to the apartment of fire origin had been left open and upon arrival of the Silver Spring Fire Department at 0248 flashover had occurred in the apartment and smoke had completely saturated the second floor corridor of both the "A" and "B" wings. The fire was extinguished with two, 2 inch hose lines one from the corridor and one from the balcony.

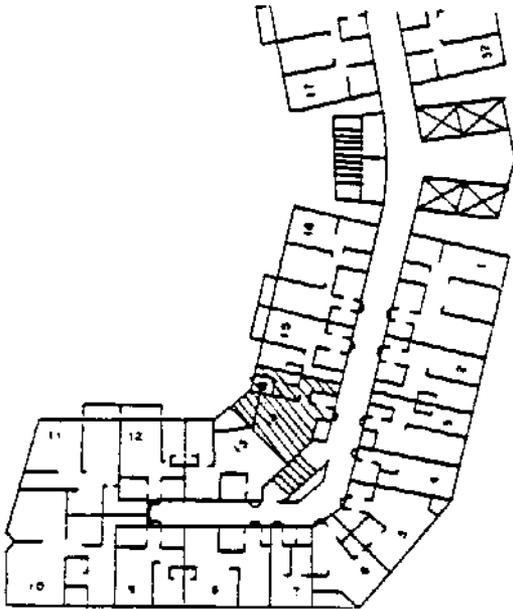
Smoke permeated most of the building being especially heavy on the second, seventh, ninth and eleventh floors.

A total fire department response of four alarms was required to assure the evacuation of over 250 occupants. Approximately 21 occupants required emergency medical treatment, 17 for smoke inhalation. The fire was confined to the apartment of origin and the immediately exposed second floor corridor area.

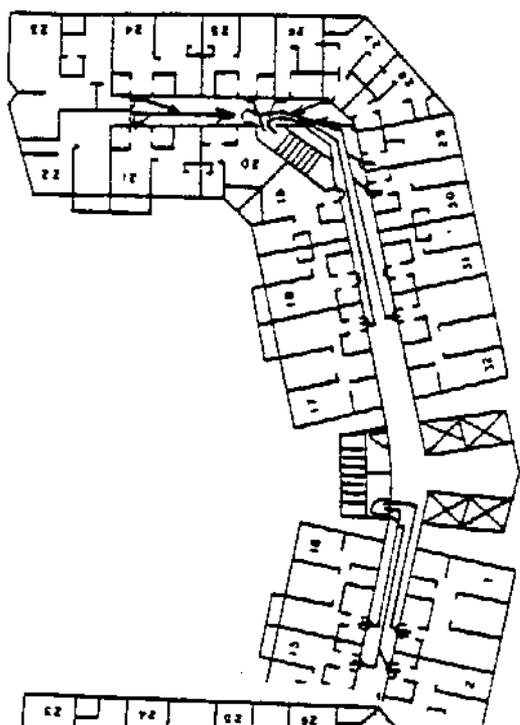
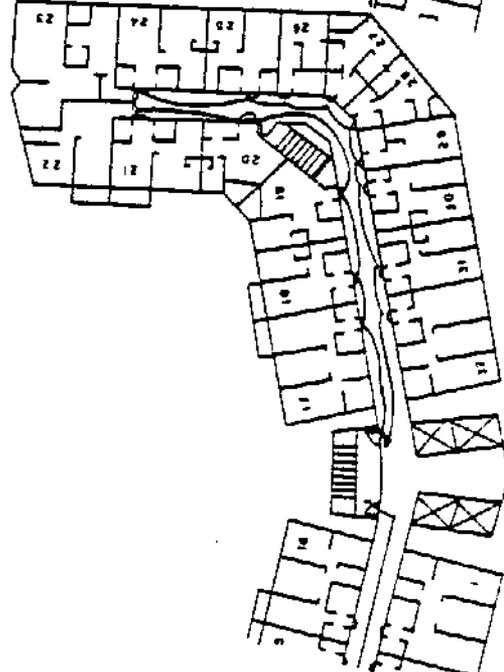
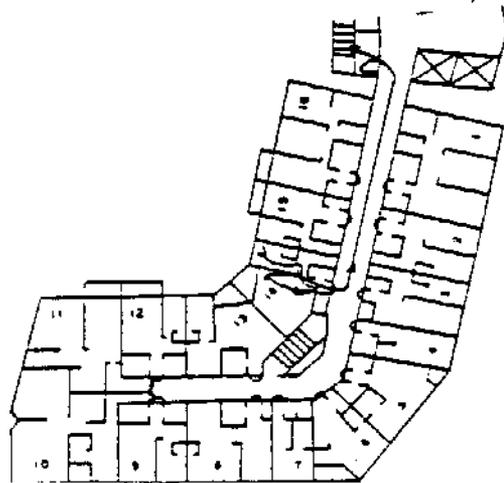
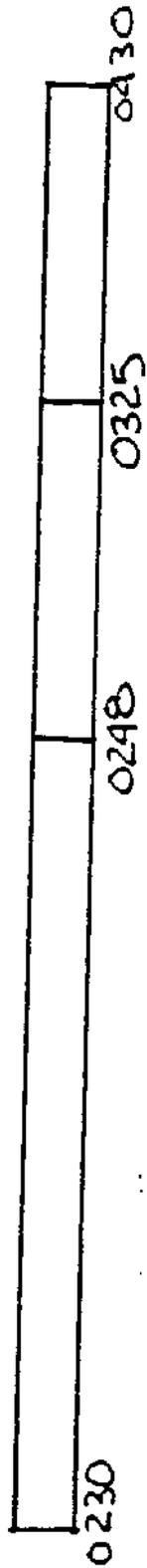
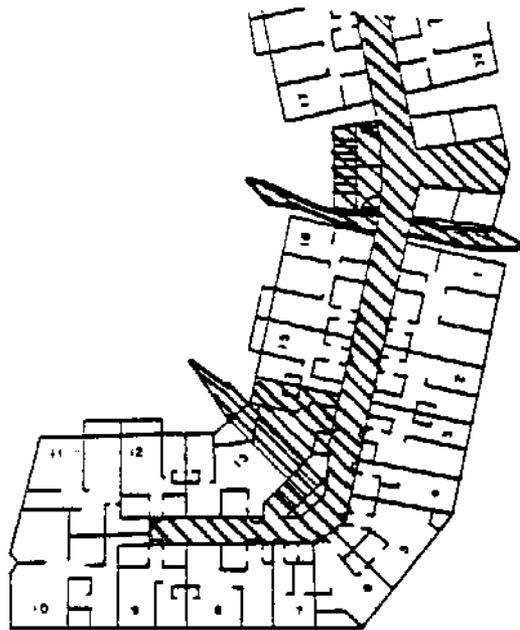
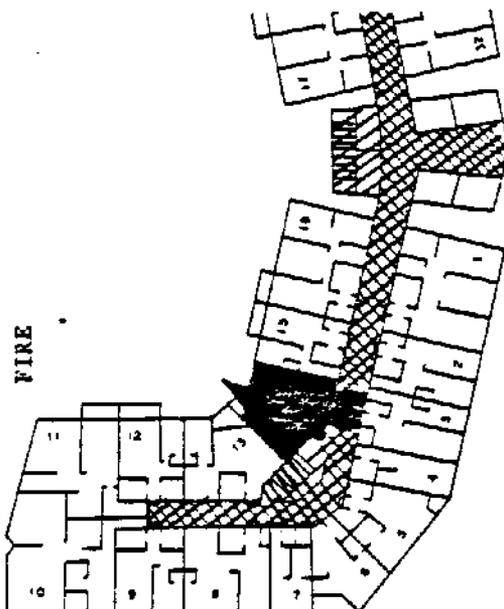
CONCLUSIONS

A. Behavioral Episodes.

1. The occupants tended to seek information to structure the situation relative to the perceived threat to their safety. The information most desired tended to relate to the personal risk involved and the need for evacuation.
2. The occupants tended to attempt evacuation behavior when physical stimulus of the fire incident were perceived in their apartments, primarily visible smoke or an intense smoke odor.
3. The occupants travelled through smoke in both successful and unsuccessful evacuation behavior.



FIRE



PEOPLE

Realms 1, 2, 3 and
Episode 1, 2, 3

4. The occupants displayed situations of altruistic behavior primarily related to cultural roles related to the age and the sex of the occupants.

5. There was some evidence of anxiety reducing behavior characterized by extreme verbalizing induced by the frustration of unsuccessful evacuation behavior.

6. The occupants often travelled large distances through smoke in their evacuation behavior. Travel away from a known exit was accepted to obtain an area of refuge from the smoke propagation.

7. The occupants tended to congregate in both the evacuation behavior and in apartments as areas of refuge in small groups of two to five persons.

B. Fire and Smoke Realms.

1. Extensive smoke spread throughout the building and appeared to have been most severely distributed on the second, seventh, ninth and eleventh floors. Some of the variables creating this condition appeared to be the following factors:

- a. The open door to the apartment of fire origin, apartment 214.
- b. Open stairway doors during fire department and occupant evacuation procedures.
- c. Arrangement of the heating, ventilating and air conditioning system with the corridors as return air plenums.
- d. The stack effect in the building due to the temperature differential between the interior and the exterior temperatures.
 - (1) The observed neutral plane of the stack effect on the seventh floor.
- e. The arrangement of the interior bathroom ventilator shafts for the apartments.
- f. The lack of any horizontal barrier to smoke spread in the corridors between "A" and "B" wings.

2. The failure of the local alarm system to effectively operate apparently resulted in an extended time of alerting and evacuation behavior by the occupants, due to the varying times of becoming aware of the fire incident.

3. The construction of the structure with the fire resistive rated interior partitions and effective fire department operations prevented fire extension from the apartment of origin, beyond the immediately exposed second floor corridor area.

31. CROWNSVILLE HOSPITAL CENTER, JANUARY 26, 1979

The fire incident at the Crownsville Hospital Center on January 26, 1979 was detected by a patient at approximately 0420. The fire at detection consisted of a flaming linen bag in the linen room of ward 91 in the Medical-Surgical Building with flames to a reported height of four to five feet. The fire was reported by phone to the facility operator, and the local alarm system was activated, and the fire department notified.

Approximately twenty-five patients were on ward 91 at the time of the fire incident. Fifteen patients were evacuated to ward 93. Nine patients were moved in beds, five were ambulatory and walked and one was carried. Smoke spread through ward 91 due to the linen room door being left open, and the open plan design of the ward. The one story, fire resistive medical-surgical building was approximately twenty-two years old.

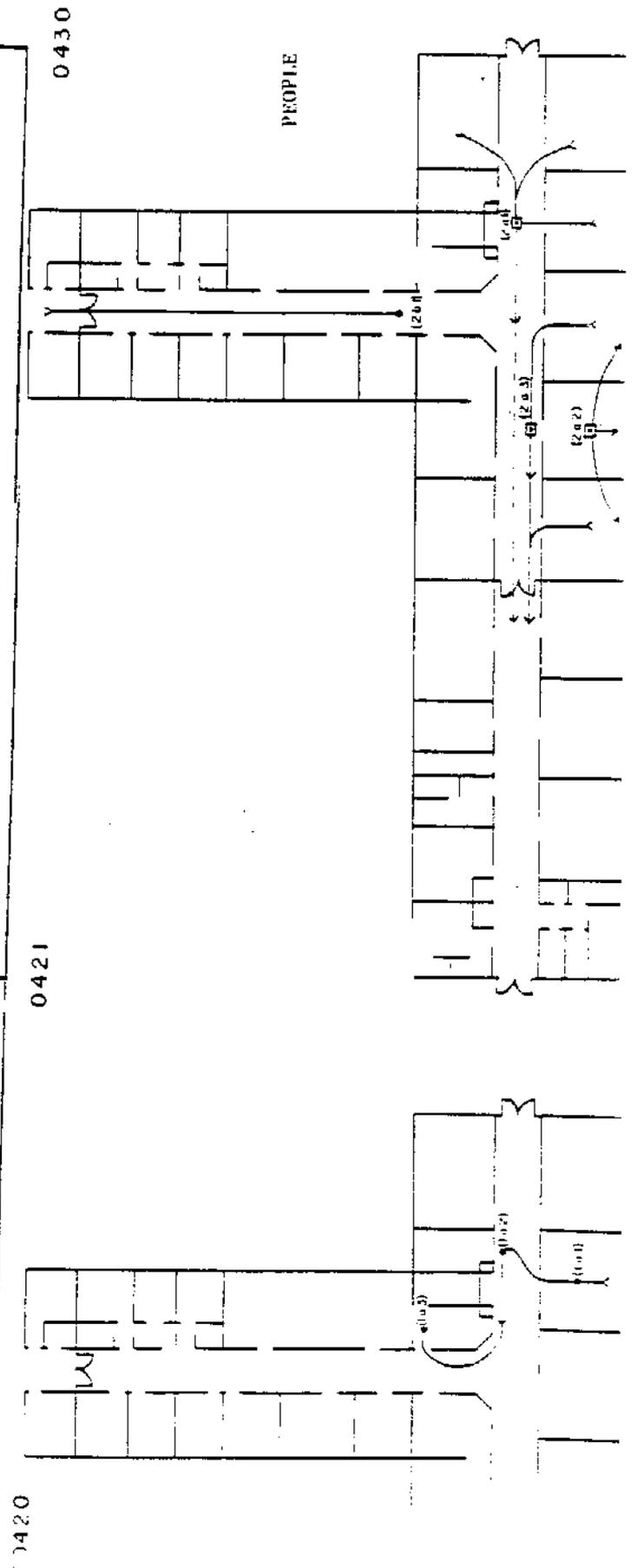
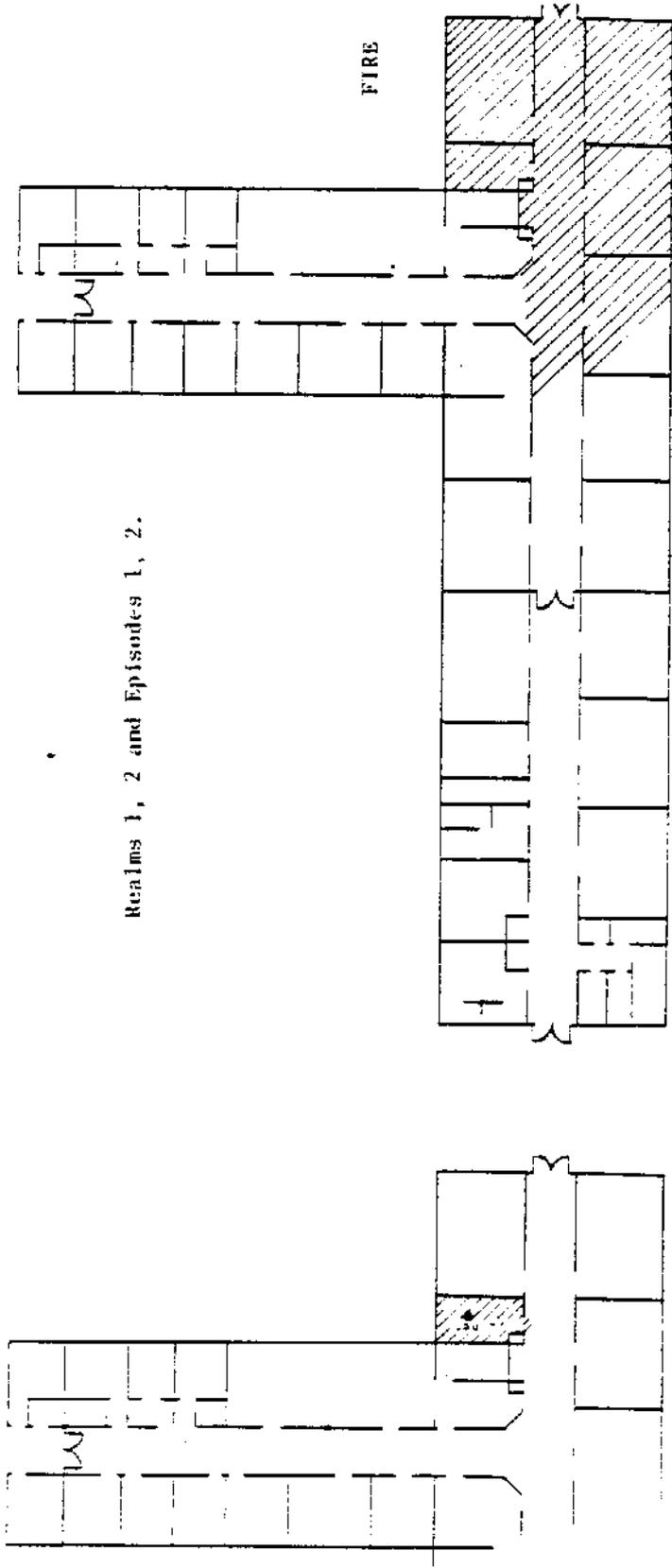
The Anne Arundel County Fire Department responded and verified the fire extinguishment by a staff member with a five pound dry chemical listed (15) extinguisher with a 5A, 10BC rating. (11) The wet pipe automatic sprinkler system also activated from a single ordinary rated head. (8) The fire department also performed salvage and overhaul operations.

CONCLUSIONS

A. Behavioral Episodes.

1. The immediate evacuation of five patients from ward 91 to ward 93 was performed in an emergency response mode, due to the perceived cues of a threatening fire in the linen room.
2. The adaptive response of dispersing and venting the smoke from ward 91 by opening windows was initiated efficiently and effectively.
3. The evacuation of the additional ten patients was initiated and performed as a precautionary procedure.
4. The opening of the ward 91 linen room door facilitated the smoke propagation and migration throughout ward 91.
5. The facility fire training program had undergone a recent lapse due to a staff vacancy.
6. The staff fire reporting procedures and evacuation actions conformed to the facility's emergency procedures.

Realms 1, 2 and Episodes 1, 2.



B. Fire Realms.

1. The open door to the linen room facilitated the smoke development in the patient areas of ward 91.

2. The open plan design with the lack of partition walls between the patient areas and the linen room facilitated the smoke dispersion.

3. The automatic sprinkler system, (8) local fire alarm system (9) and the smoke barrier doors functioned effectively as designed.

4. The five pound listed (15) dry chemical extinguisher rated 5A, 10BC (11) was properly maintained and functioned as designed.

32. UNIVERSITY OF MARYLAND HOSPITAL, FEBRUARY 6, 1979

This fire incident at the University of Maryland Hospital on February 6, 1979 was detected by a nurse at approximately 0840 hours. The nurse was alerted to the observation of flames in a microwave oven in the emergency room doctor's lounge, room G-1142 by a loud unusual noise. The nurse immediately reported the fire at the emergency room treatment area nurses station. The hospital emergency procedures were initiated with a phone call to the University Communication Center (8) and activation of the building local alarm system.(9)

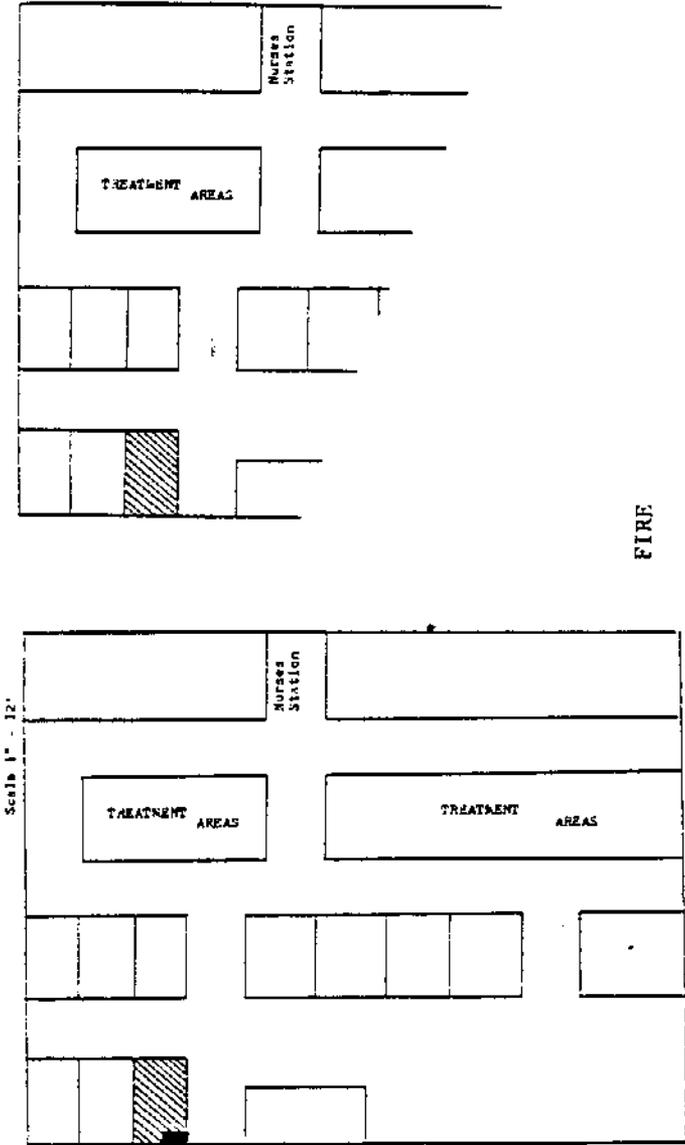
The fire in the microwave oven was extinguished by the nurse using a 10 pound, listed (15) carbon dioxide extinguisher, rated 5 B.C.(11) Following extinguishment a light haze of smoke was confined to the doctor's lounge. One patient in an adjacent emergency room treatment area was evacuated as a precautionary action.

The fifteen story North Hospital Building of fire resistive construction was approximately five years old. At the time of the fire incident the twenty-five patient emergency room treatment area had ten patients. The Baltimore City Fire Department responded and verified extinguishment.

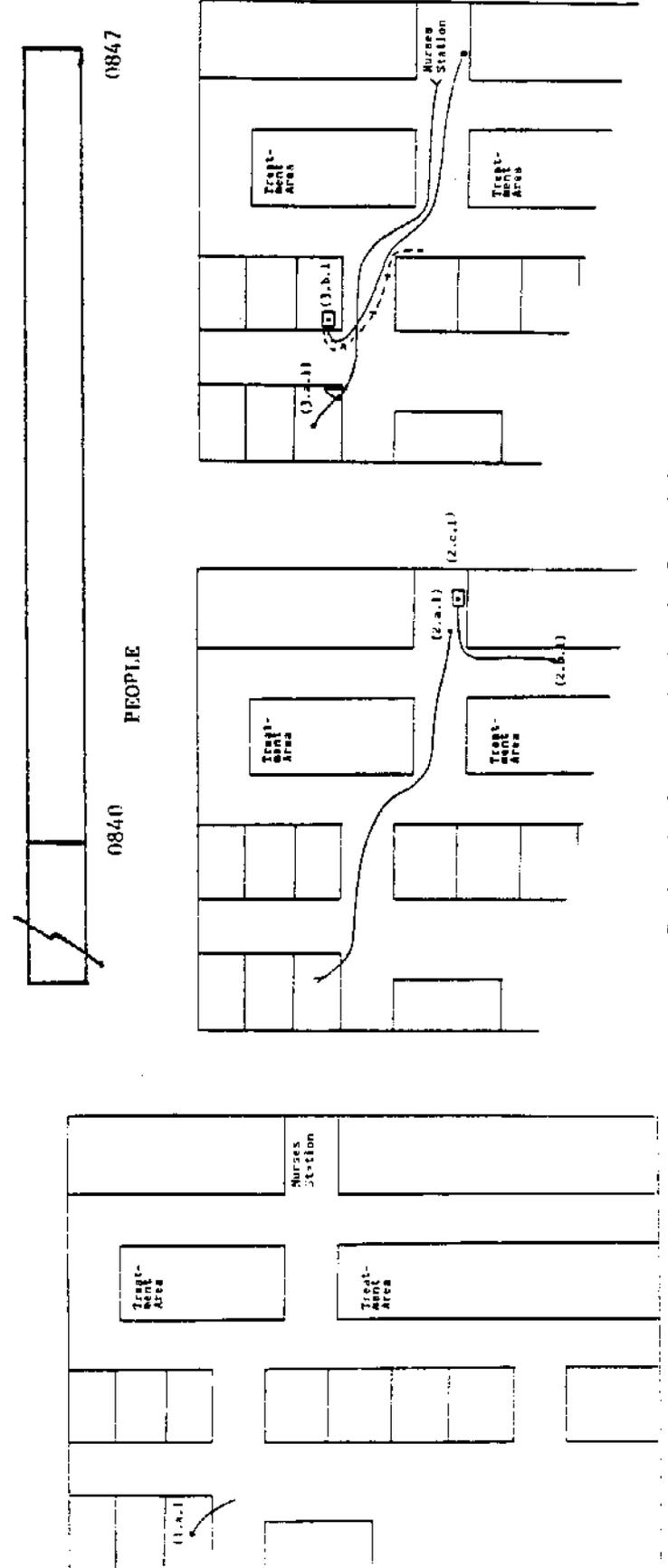
CONCLUSIONS

A. Behavioral Episodes.

1. The facility emergency procedures were initiated and implemented effectively including: the provision for facility alarm, fire department notification, protection of patients and manual suppression.
2. Oxygen equipment was not disconnected due to the limited fire threat. However, the fire conditions were monitored and preparations were made for manual ventilation of a cardiac patient.
3. The adaptive behavioral actions during this fire incident appeared to be a result of staff training and the professional competence and experience of the nursing staff.
4. The staff actions in the effective use of a 10 pound listed (15) carbon dioxide extinguisher, rated 5 B.C. (11) to suppress the fire appeared to be the result of previous training.



FIRE



Realms 1, 2 and Episodes 1, 2, and 3

B. Fire and Smoke Realms.

1. The audible devices of the local alarm system did not operate as designed due to system maintenance being conducted at the time of the fire incident.

2. The physical environment of the patient treatment areas was not affected by the incipient fire in the oven in the separated doctors lounge.

3. The 10 pound listed (15) carbon dioxide extinguisher, rated 5 B.C. (11) was properly charged and operated as designed.

33. SHEPPARD PRATT HOSPITAL, FEBRUARY 7, 1979

This fire incident occurred at approximately 0832 hours on February 7, 1979 in the main kitchen on the first floor of the Central Building. The fire was immediately detected by two of the kitchen staff since it was initiated with the explosive rupture of an aerosol can of grill cleaner. The can became a projectile and upset two 1 and 1/4 gallon cans of cooking grease which upon contacting heated areas of the gas fired stove and grill, immediately ignited. The resulting flames involved an area on the grill surface of approximately six square feet, with eight inch high flames. The smoke produced was immediately exhausted through the kitchen grill hood and duct system. The fire was extinguished by kitchen staff personnel using a 10 pound, listed (15) carbon dioxide, rated 5 B, C (11) extinguisher.

The facility emergency procedures were initiated by the staff and both the hospital fire brigade and the Baltimore County Fire Department responded. The fire had been extinguished by the kitchen staff before the arrival of the fire brigade or the fire department.

The dry chemical stove and duct extinguishing system were not activated in this fire incident. The fire had no effect on any area beyond the kitchen in this three story and basement fire resistive building, which is approximately 80 years old. None of the patients in this 301 bed capacity psychiatric care institute were involved or threatened by this isolated and controlled fire incident and no patients were evacuated.

CONCLUSIONS

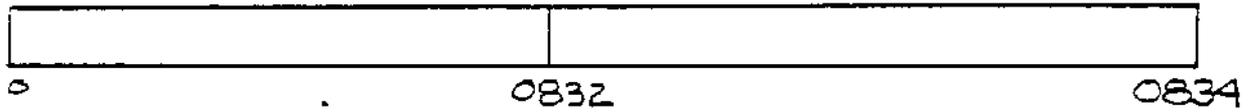
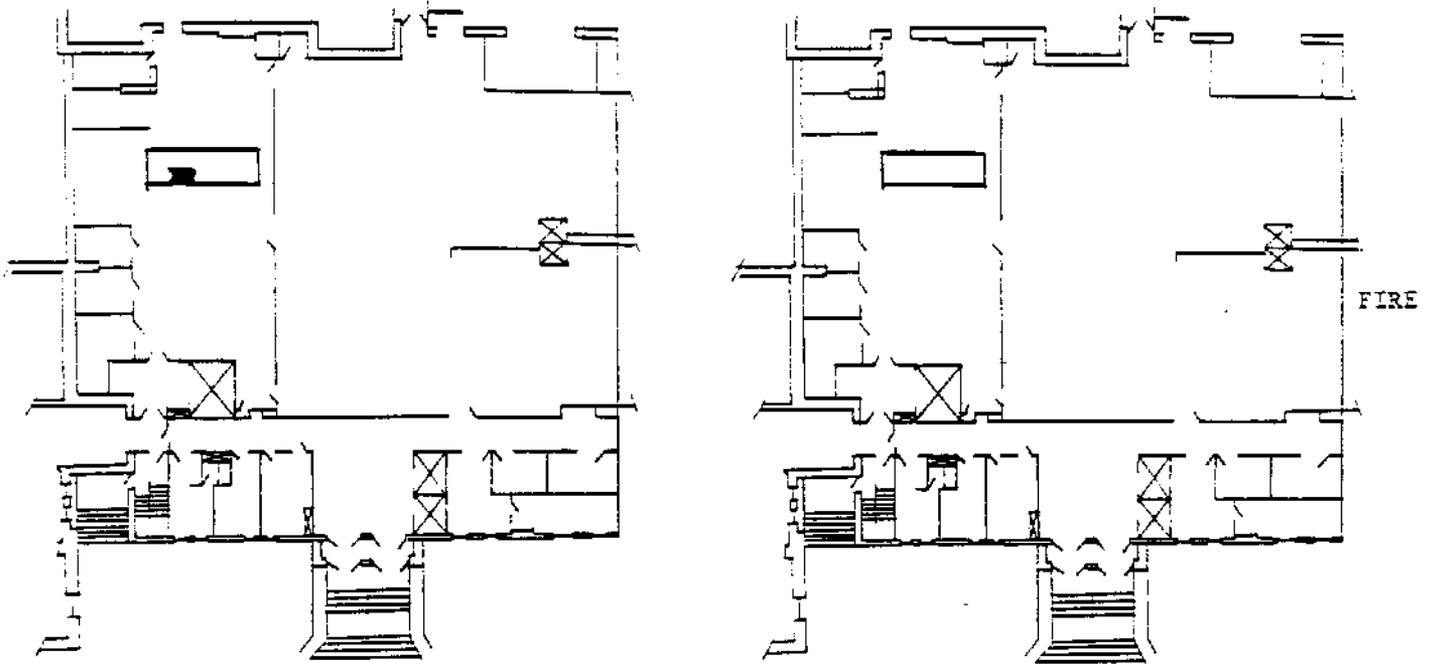
A. Behavioral Episodes.

1. The actions of the kitchen staff in initiating the alarm and extinguishment actions were immediate, necessary and in conformance with the emergency procedures. This adaptive behavior appeared to be due to the staff training.

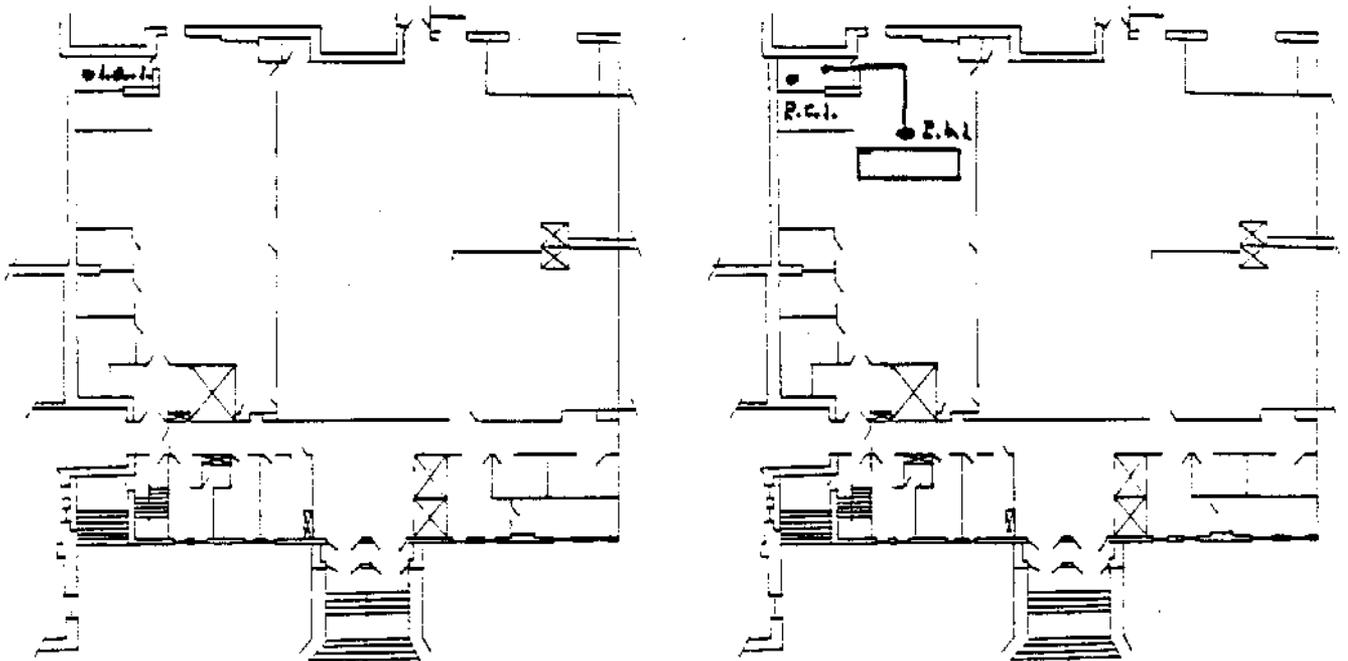
B. Fire and Smoke Realms.

1. There was no reported operation of the dry chemical extinguishing system protecting the grill and hood and duct system.
2. The 10 pound listed (15) carbon dioxide fire extinguisher was properly charged and operated as designed.

Realm 1, 2 and Episodes 1, 2



PEOPLE



34. PIKESVILLE NURSING AND CONVALESCENT CENTER, FEBRUARY 8, 1979

This fire incident at the Pikesville Nursing and Convalescent Center on February 8, 1979 was initially detected by a laundress entering the laundry room. The laundress turned off the washing machine and also manually tripped the circuit breaker immediately after detection, which resulted in the extinguishment of the fire.

The laundress then called the desk receptionist to initiate the facility emergency procedures and to notify the Baltimore County Fire Department. Patient room doors were closed by staff personnel and no patients were evacuated during this fire incident.

Damage was limited to clothing inside the washing machine located in the basement of this two-story, 8 year old facility of protected non-combustible construction. The Baltimore County Fire Department responded and verified extinguishment.

CONCLUSIONS

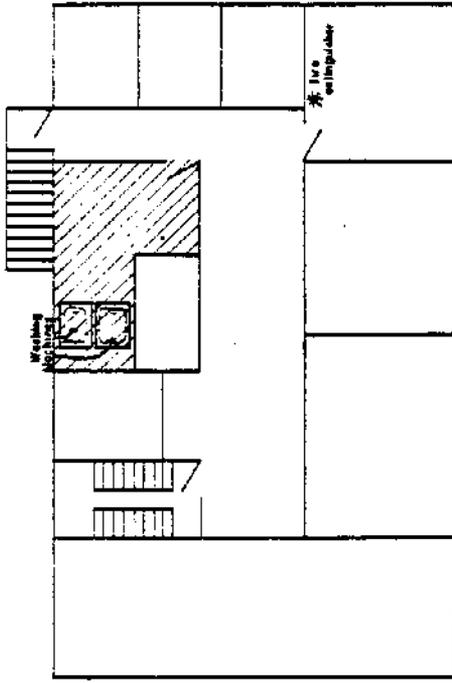
A. Behavioral Episodes.

1. The adaptive behavioral action of de-energizing the washing machine was effective in nullifying the fire threat. " "
2. The initiation of the alerting procedure and the obtaining of an extinguisher was adaptive behavior conducted in accordance with the facility emergency procedures.

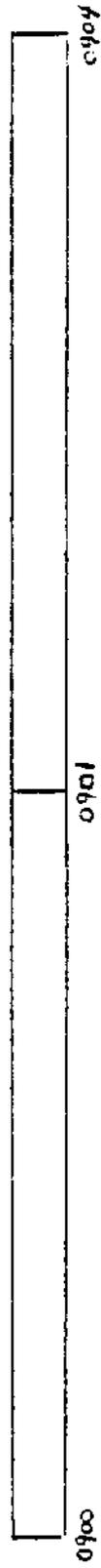
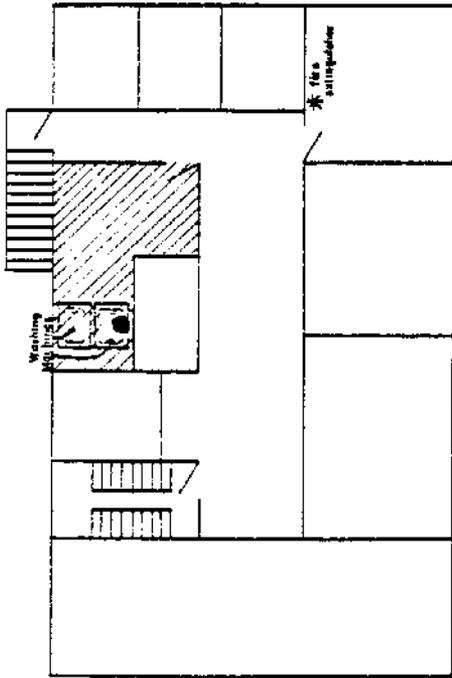
B. Fire and Smoke Realms.

1. There was no reported smoke detector or automatic sprinkler activation in this fire incident.

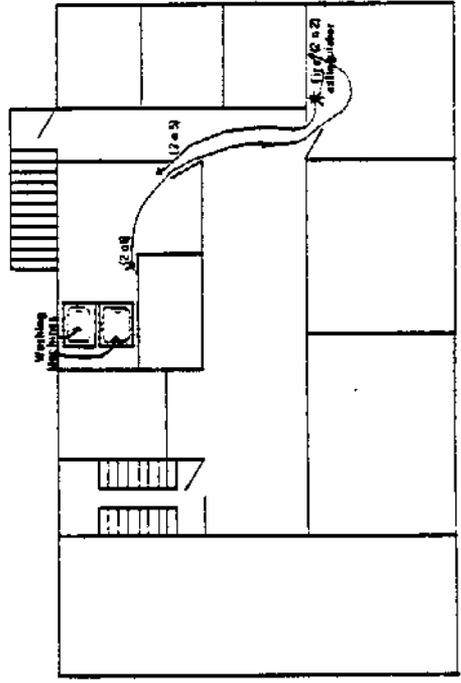
Realms 1, 2 and Episodes 1, 2



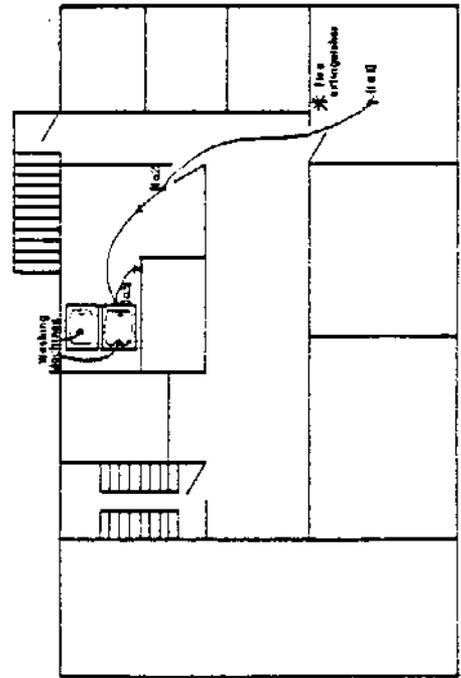
FIRE



0901



PEOPLE



HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses.

(Personnel obtained a portable extinguisher from the laundry supply room and returned to the laundry room to investigate the progress of the fire.)

1. Personnel appeared to expect continued development of the fire in the laundry equipment following the de-energization procedures.

B. Alternative Behavior Hypotheses.

(Personnel within the facility closed patient room doors and placed linen in front of occupied room doors upon hearing the verbal public address system "Code One" announcement.)

1. The selection of behavioral alternatives by staff personnel, appeared to be primarily influenced by the staff training and their knowledge of the facility emergency procedures.

35. ELLICOTT CITY MIDDLE SCHOOL, FEBRUARY 14, 1979

This fire incident at the Ellicott City Middle School was detected at approximately 1030 hours on February 14, 1979. The fire was apparently detected in the two story ordinary construction building, approximately forty years old, by two teachers simultaneously. The detection involved an observation of a light haze of smoke in the second floor learning center with an odor of smoke. An odor of smoke was also detected in the first floor corridor near the cafeteria. Investigation of the source of the first floor odor resulted in the observation of a smoke accumulation in the locked and unoccupied band room.

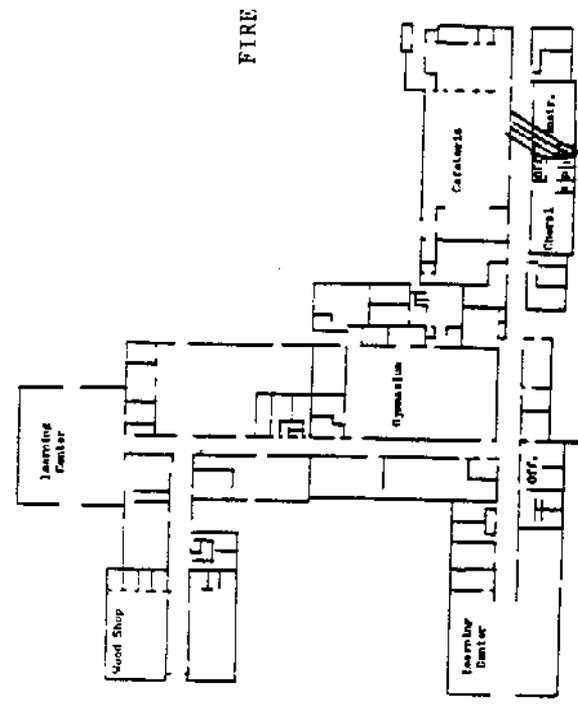
Approximately four teachers and 120 students, the classes from the first floor cafeteria and the second floor learning center, initiated their evacuation prior to the activation of the local alarm system. The remaining 27 teachers and 400 students evacuated the building in approximately 1-1/2 minutes. With the activation of the local alarm system, the school secretary notified the Howard County Fire and Rescue Emergency Communications Center by phone and the Ellicott City Volunteer Fire Company was dispatched.

Due to the extreme cold weather, about 20 degrees F., the principal allowed the students and teachers to reenter the building to the gymnasium on the first floor after five minutes. The fire department command officer upon arrival requested the total evacuation of the building again. The fire department completed extinguishment of the fully developed post flashover fire in the first floor band room with 1-1/2 inch hose lines in approximately twenty minutes.

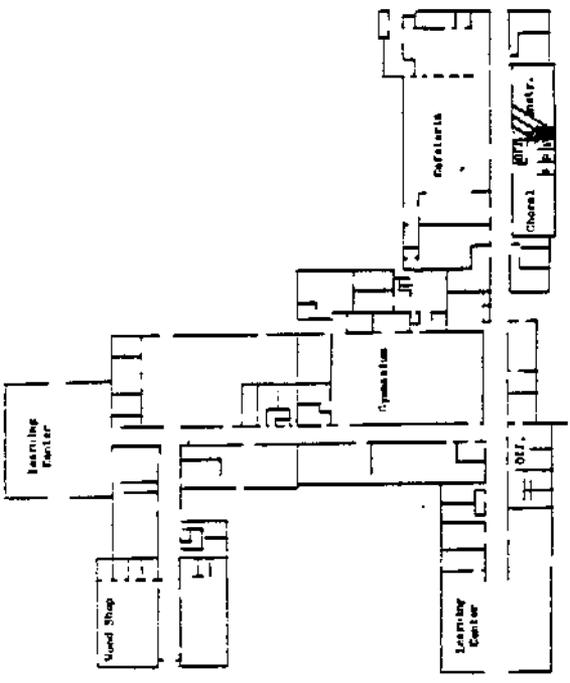
CONCLUSIONS

A. Behavioral Episodes.

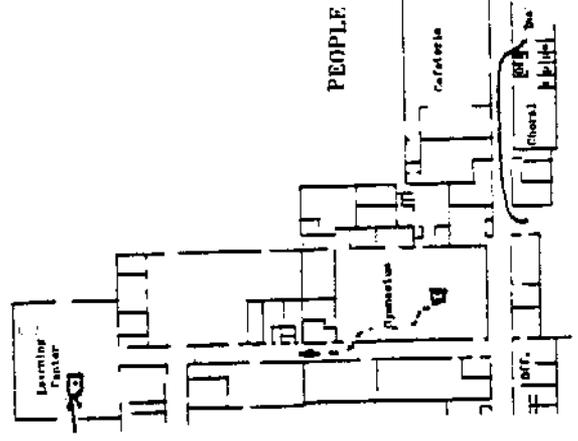
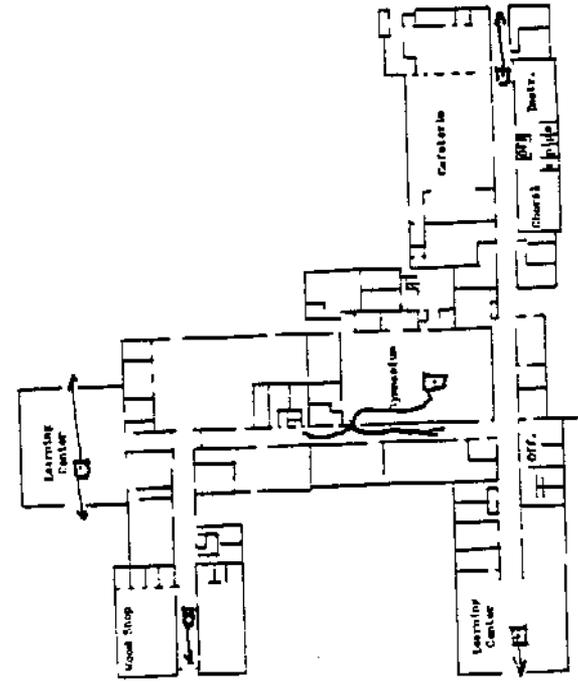
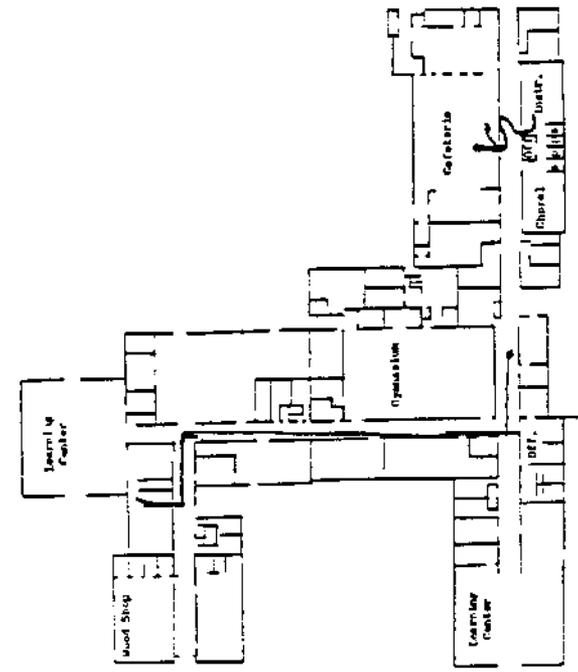
1. There was some delay in the activation of the local fire alarm system, apparently due to staff need for verification of the fire induced cues.
2. The immediate evacuation of the second floor area was an adaptive response to the developing smoke and heat exposure.



FIRE



106



PEOPLE

Realms 1, 2 and Episodes 1, 2, 3

3. The fire was apparently detected simultaneously by two different teachers in different areas of the building. The fire was detected involving two distinct perceptual visual and olfactory cues.

4. The evacuation of the school was orderly and effective partially as a result of periodic fire evacuation drills. This evacuation was reported to have been completed in approximately 1-1/2 minutes.

5. The actions of staff personnel in initiating the evacuation of some classes prior to activation of the local alarm system had no significant effect in this fire incident.

B. Fire and Smoke Realms.

1. The frequency of tone generation of the audible alarm system in the zone of fire origin was too slow to be noticable. Approximately one tone every 20 seconds was noted as opposed to the design frequency of one tone every 5 seconds. The system reportedly operated as designed in the two other alarm zones in the building.

2. The ceiling and wall construction assembly in the band storage room performed satisfactorily relative to fire resistance. However, smoke migrated through openings to the second floor learning center.

36. HIDDEN BROOK TREATMENT CENTER, FEBRUARY 15, 1979

This fire incident was detected at approximately 2330 by the activation of a smoke detector in the first floor corridor and the concurrent activation of the local alarm system.(9) The nursing staff of three persons and one visitor directed and assisted the thirty-five ambulatory patients from the building in approximately seven minutes.

The fire was initiated in the first floor lounge of the four story protected ordinary constructed building. The spread of fire within the lounge was initiated by fire retardant treated wall panelling. The vertical spread of flames and heat up the west stairway was limited by the one hour fire resistant rated door at the first floor. The spread of smoke was limited to a light accumulation in the patient occupied areas, even though dense smoke was observed in the first floor lounge, due to the effective operation of the corridor smoke barrier doors.

The Harford County Communications Center was immediately notified by the staff. The Bel Air Volunteer Fire Department responded and extinguished the fire with one 1-1/2 inch hose line within 15 minutes of the activation of the detector, confining the fire to the area of origin, the first floor lounge. The fire department also performed ventilation, overhaul and salvage operations.

CONCLUSIONS

A. Behavioral Episodes.

1. The investigation by the nursing staff personnel to locate the source of the smoke would have been facilitated with observation of the alarm system annunciator panel.

2. The evacuation of the 35 patients was effectively performed in approximately seven minutes with the patients mobility and alertness substantially enhancing the evacuation procedure.

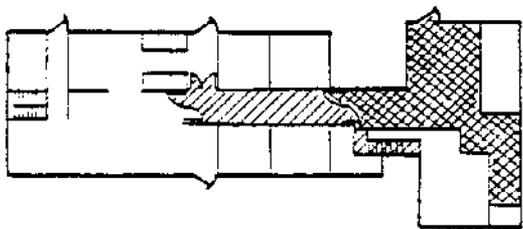
3. Fire department personnel performed the suppression procedures efficiently and effectively in limiting the fire propagation to a portion of the first floor lounge.

B. Fire and Smoke Realms.

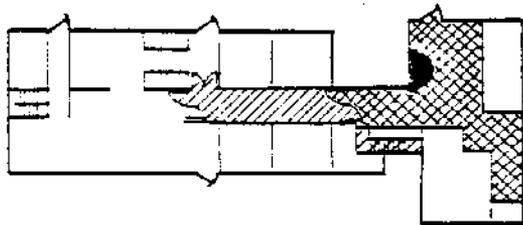
1. The fire retardant coating on the wood panelling appeared to inhibit the flame spread and reduced the rate of flame propagation on the wall surfaces of the first floor lounge and extended the time of burning thus preventing the occurrence of flashover.

2. The smoke barrier doors in the first floor corridor leading to the patient rooms from the fire zone effectively restrained most of the smoke from propagating into the first floor patient room area.

Realms 1, 2 and Episodes 1, 2, 3

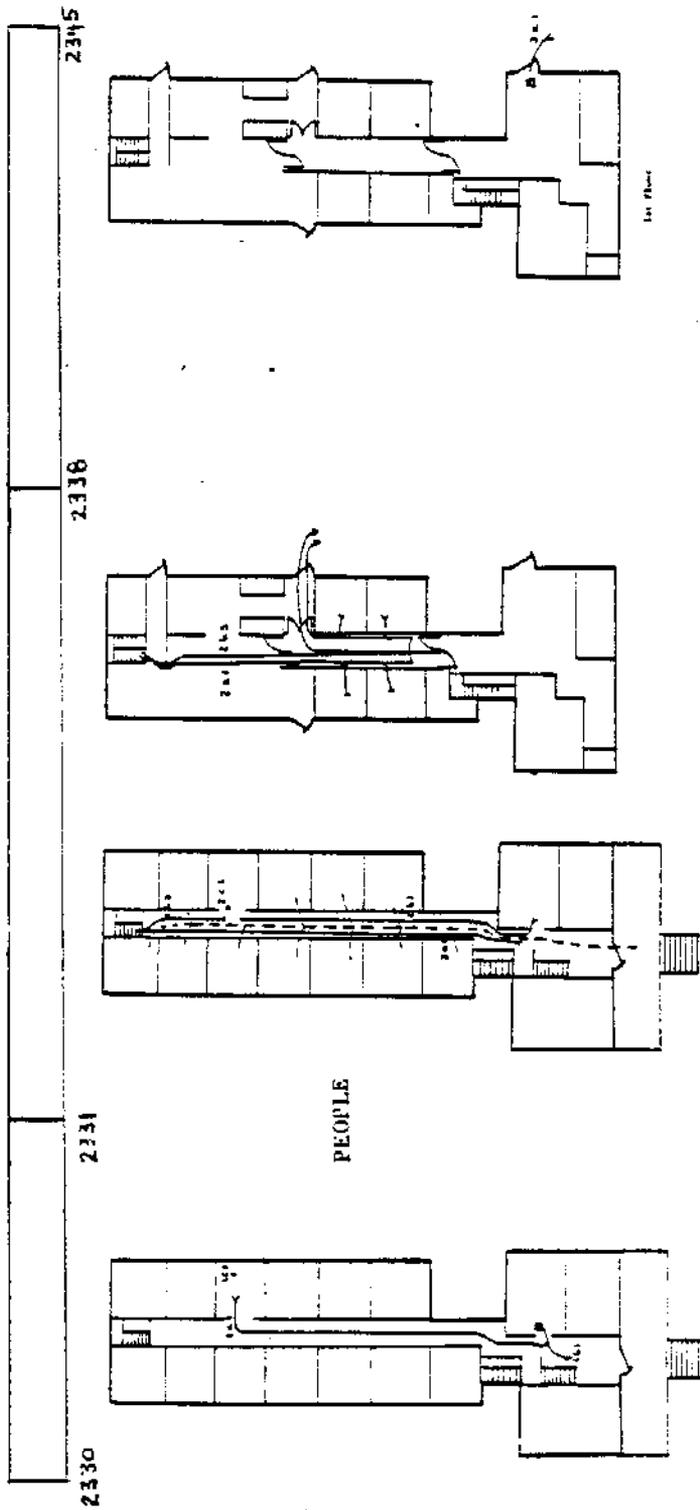


FIRE



1st Floor

1st Floor



2330

2331

2336

2345

PEOPLE

1st Floor

1st Floor

1st Floor

1st Floor

3. The omission of a door at the second floor entrance to the east stairway allowed smoke to propagate with the thermal column to the second floor corridor.

4. The local alarm system (9) operated as designed.

5. A smoke detector in the first floor corridor of the patient room zone activated and operated as designed.

6. The labelled Class "B", one hour fire resistive rated door (14) at the first floor entrance to the east stairs prevented heat, flame and heavy smoke penetration to the stairway.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participant's in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses.

1. Nursing personnel appeared to interpret the activation of the local alarm system (9) as a routine event until the reinforcing observation of smoke.

2. Nursing personnel appeared to not expect the density of smoke development in the fire zone.

B. Alternative Behavior Hypotheses.

1. Nursing personnel appear to select behavior which offers the most benefit and protection to the patients from the threat of fire and smoke.

2. The selection of behavioral alternatives by nursing personnel, appeared to be primarily influenced by the training and their knowledge of the facility emergency procedures.

37. MONTGOMERY GENERAL HOSPITAL, MARCH 28, 1979

This fire incident at the Montgomery General Hospital on March 28, 1979 was initially detected by a nurses aide on the fifth floor, west wing as an odor of smoke while she was in room 517 at approximately 0100. The nurses aide immediately notified the charge nurse. Both nursing personnel then investigated to determine the source of the smoke odor.

A light haze of smoke was observed at the ceiling of room 516, and a smoldering fire approximately four to five inches in diameter, on the cotton bed spread of an occupied patient bed. The nursing staff removed the bed spread and top sheet to a bathroom across the corridor and extinguished the fire in a sink. One staff member remained with the patient, and following extinguishment the nursing shift coordinator and the fire department were notified.

The Sandy Spring Volunteer Fire Department responded and verified extinguishment. The facility local alarm system and verbal fire announcement were not initiated and no evacuation was conducted in this 7 story fire resistive building constructed in 1971.

CONCLUSIONS

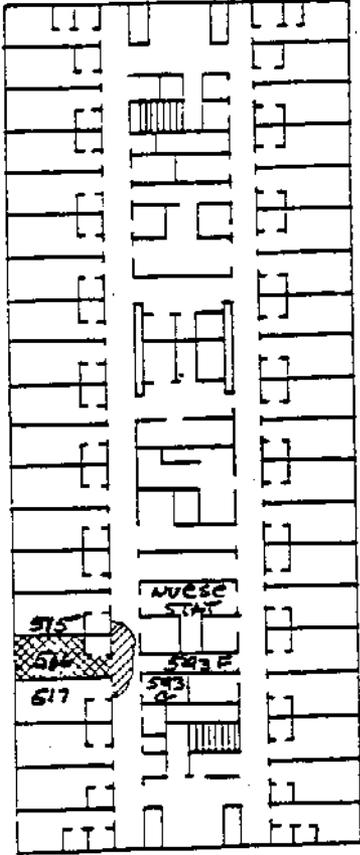
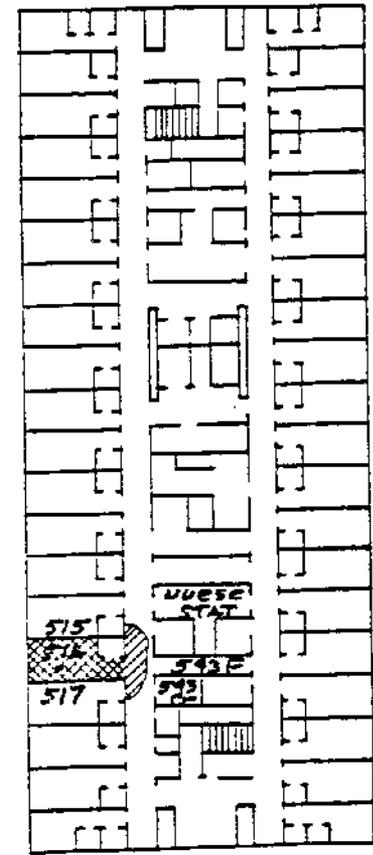
A. Behavioral Episodes.

1. The staff responded and reacted in an adaptive manner, extinguishing a smoldering cotton bedspread fire in a manner least disruptive to the hospital population.
2. The staff did not evacuate or move the patient in room 516, and no apparent risk to the patient resulted from this action.
3. The local alarm system and the facility public address system were not activated during this fire incident.

B. Fire and Smoke Realms

1. There was no reported activation of any smoke detector or automatic sprinkler head in the hospital.
2. The cotton bedspread apparently contributed to the retarded growth of the incipient fire.

Fire



0100

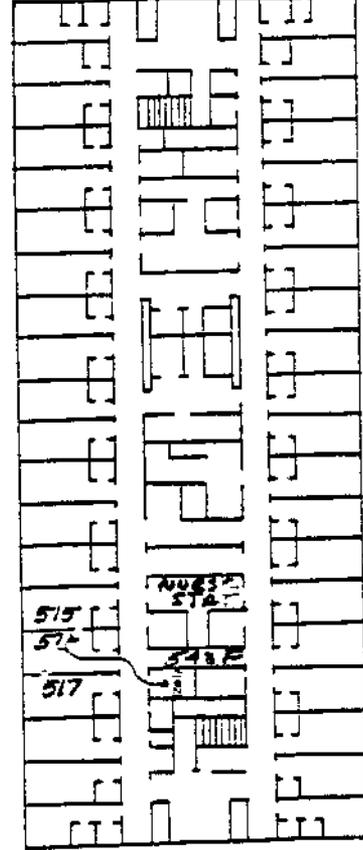
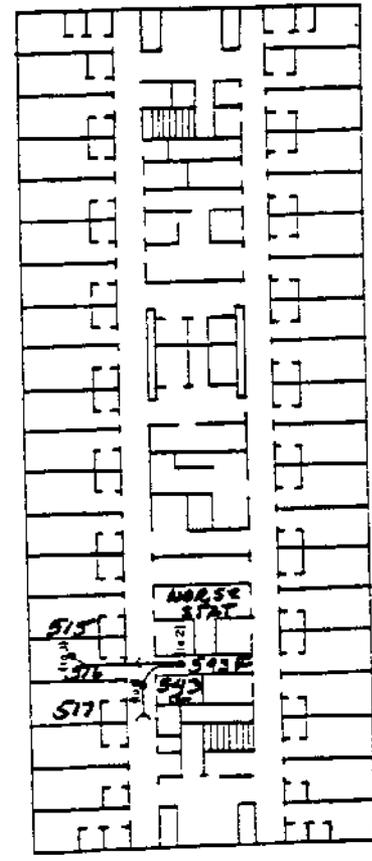


0103



0104

People



38. UNIVERSITY OF MARYLAND HOSPITAL, APRIL 4, 1979

This fire incident at the University of Maryland Hospital on April 4, 1979 was detected by two nurses at approximately 2130 hours. The nurses observed light white smoke being discharged from a heating and air conditioning unit with electrical arcing in room 4-207. The two patients in the room were evacuated and the facility emergency procedures were initiated with the phone call to the University Communication Center (8) and the activation of the building local alarm system (9).

The fire was attacked by a nursing staff member with a listed (15) 3A, 30BC rated, (11) all purpose dry chemical extinguisher. All ten patients on wing 4B were evacuated, eight patients in their beds, and two of these patients required portable oxygen. The initial arriving fire department personnel from the Baltimore City Fire Department assisted in the evacuation of the last three patients. Fire department personnel extinguished the fire by disconnecting the electrical power supply to the unit and the fire then self extinguished.

The fire department removed glass from two openable windows in rooms 4-207 and 4-209 to achieve ventilation in this twelve story main hospital building of fire resistive construction.

CONCLUSIONS

A. Behavioral Episodes:

1. The staff immediately evacuated the two threatened patients and initiated the confinement, alarm and evacuation procedures in accordance with the facility emergency procedures.

2. The total evacuation of wing 4B was primarily a precautionary measure due in part to the critical condition of the ten patients.

3. Eight of the ten patients evacuated were removed in their beds.

4. The portable fire extinguisher appeared to be ineffective on the energized electrical fire.

5. The adaptive actions of the nursing staff personnel appeared to be the result of previous training.

B. Fire Realms

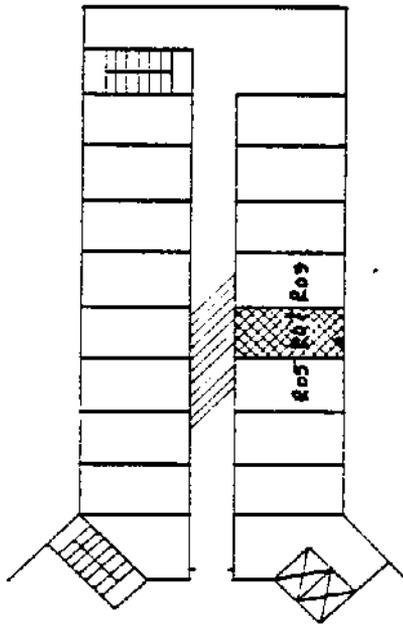
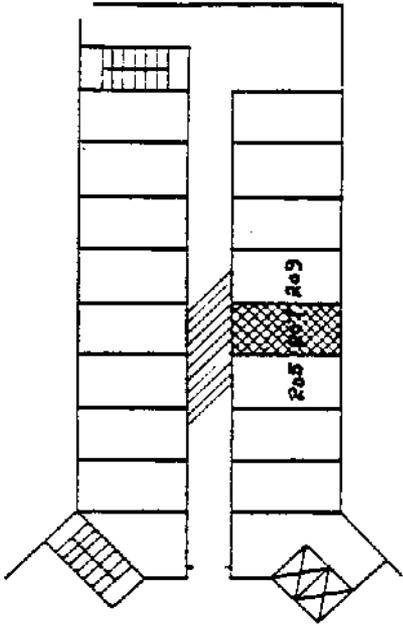
1. The local alarm system (9) functioned as designed.

2. The limited smoke spread into the corridor appeared due to staff movement through room 4-207 door in the patient evacuation activity.

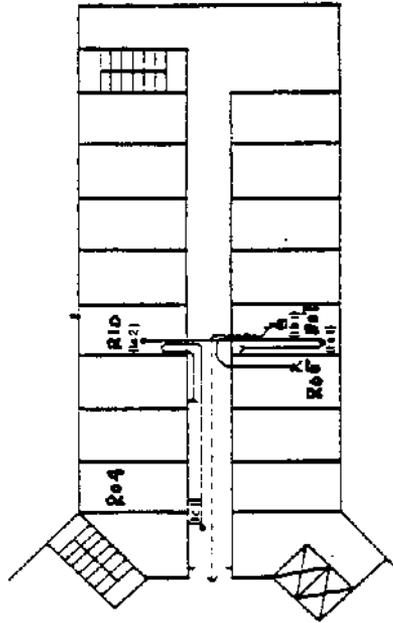
3. The listed (15), 3A, 30BC rated (11) dry chemical extinguisher was properly used and operated as designed.

4. The smoke barrier doors on the fourth floor of the facility operated as designed with the activation of the local alarm system (9).

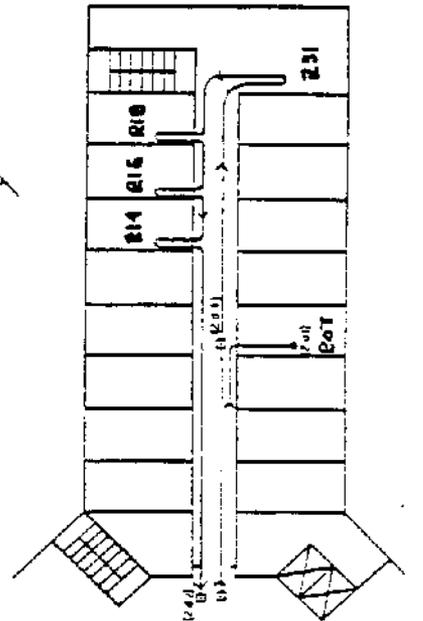
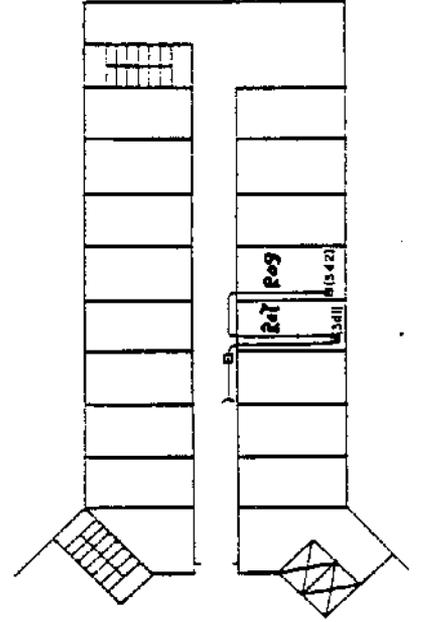
Realms 1, 2 and Episodes 1, 2, 3



FIRE



PEOPLE



39. SHEPPARD PRATT HOSPITAL, APRIL 5, 1979

The fire incident at the Sheppard and Enoch Pratt Hospital on April 5, 1979 was detected by a patient at approximately 1721. The fire at detection consisted of the blankets, linen and top surface over three-fourths of the area of a single bed in room 110 of wing 1-E of the Chapman Building. The fire was reported by phone to the facility operator who initiated the "fire call" announcement on the public address system and notified the Baltimore County Fire Department.

The approximately twenty ambulatory patients on the wing at the time of the fire were evacuated initially through the smoke barrier door to the stairway and eventually to the second floor of the building. The fire was extinguished by staff and the facility fire brigade, expending fifteen 5 pound dry chemical listed (15) extinguishers with a 5A, 10BC rating.(11) The fire department responded, verified extinguishment and performed salvage and overhaul operations.

CONCLUSIONS

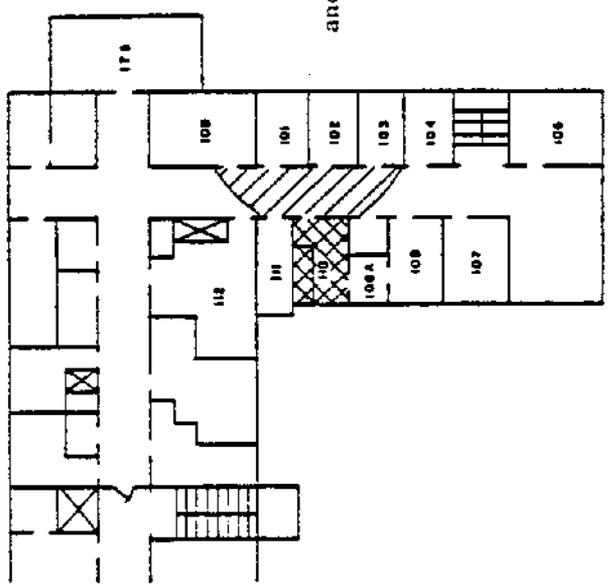
A. Behavioral Episodes.

1. The facility emergency procedures were initiated and implemented effectively including: the provision for facility alarm, fire department notification, the protection of patients and manual suppression.
2. The adaptive behavioral actions during this fire incident appeared to be a result of staff training and the professional competence and experience of the nursing staff, security staff, and the facility fire brigade.
3. The staff actions in the use of fifteen, 5 pound listed (15) dry chemical extinguishers, rated 2A, 10BC (11) to suppress the fire appeared to be the result of previous training.
4. The ambulatory characteristics of the patients in wing 1-E facilitated their evacuation.

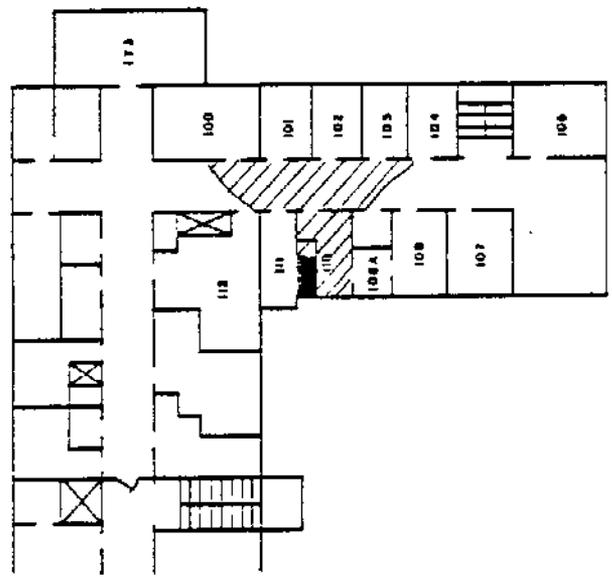
B. Fire and Smoke Realms.

1. The majority of the smoke was contained to the room of origin, room 110

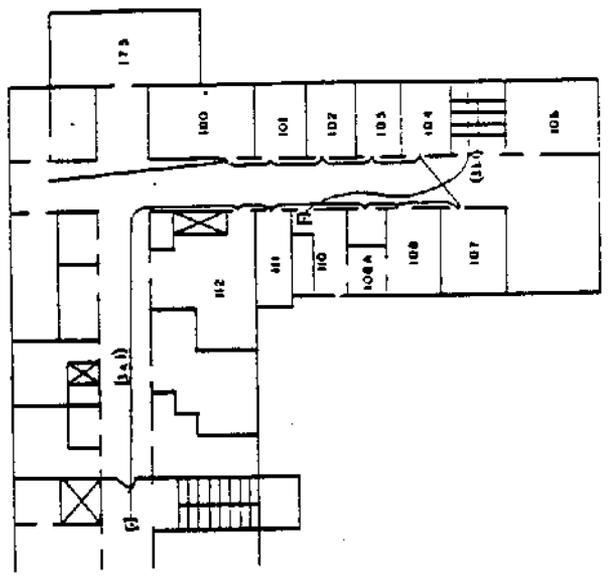
Realms 1, 2
and Episodes 1, 2, 2



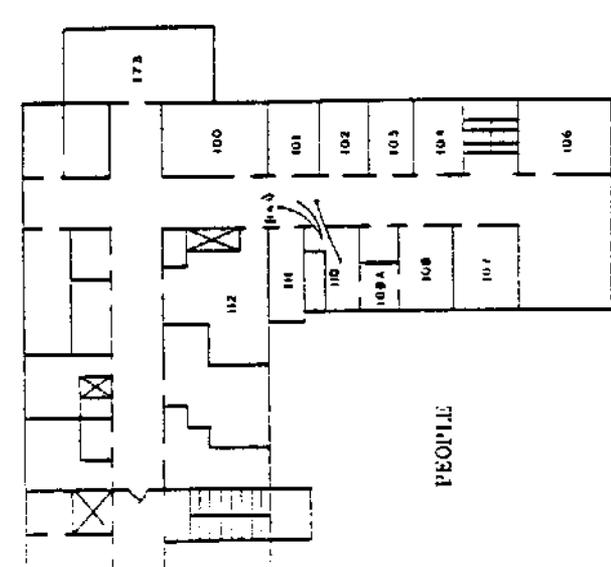
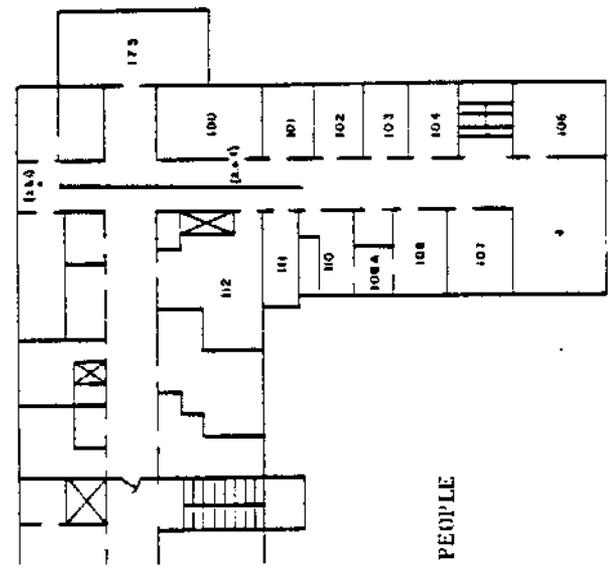
FIRE



PEOPLE



PEOPLE



due to the closed room door, thereby maintaining the corridor environment as tenable.

2. The 5 pound listed (15) dry chemical extinguishers, rated 5A, 10BC (11), were properly charged and operated as designed.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses.

1. Personnel appear to interpret the verbal fire alarm public address system announcement as a valid emergency announcement due to their previous experience in the facility.

2. Personnel appeared to expect control of the fire incident due to their training, their concept of professional competence and their previous experience with fire incidents at the facility.

B. Alternative Behavior Hypotheses.

1. Nursing and staff personnel appear to select behavior which offers the most benefit and protection to the patients from the threat of fire and smoke.

2. The selection of behavioral alternatives by staff personnel, appeared to be primarily influenced by the staff training and their knowledge of the facility emergency procedures.

40. TAYLOR HOUSE, April 11, 1979

This fire incident originated on a sofa in the first floor lounge of the duplex unit at 1715 Lamont Street, N.W. Washington, D.C. on April 11, 1979. The duplex dwelling at 1715 - 17 Lamont Street, was known as the "Taylor House" and operated as a Community Residence Facility for fifty-one psychiatric residents on an out-patient status from St. Elizabeth's Hospital. The three story facility of ordinary and wood frame construction was approximately 75 years old. The facility was operated and staffed by the Volunteers of America, at the time of the fire incident there were a total of 26 residents in the 1717 duplex unit which received only light smoke damage. There were a total of 21 residents in the 1715 duplex unit with two staff members at the time of the fire incident.

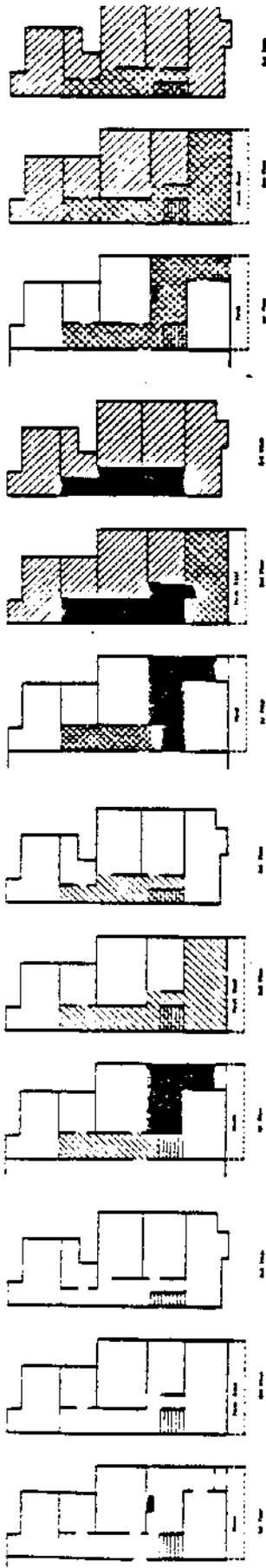
This fire incident was initially detected by a resident who observed flames approximately two inches high on the couch and attempted to extinguish the flames with a jar of water four times at approximately 0056 hours. The resident alerted the staff member who phoned the maintenance man, residing in the basement, and then the fire department, who received the alarm, for a sofa a fire at 0059.

The flames, heat and smoke spread up the one interior open stairway creating an untenable condition for the egress of the residents. The residents were thus forced to await rescue from the windows of their rooms or to egress to roofs from their room windows. Two residents jumped from the second floor and were severely injured, one fatally.

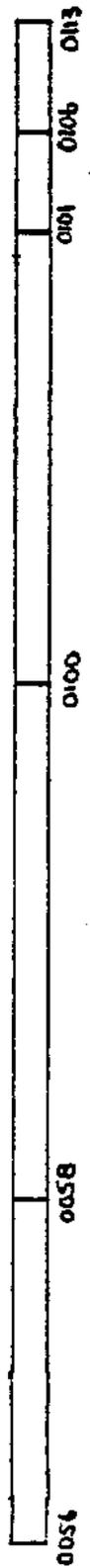
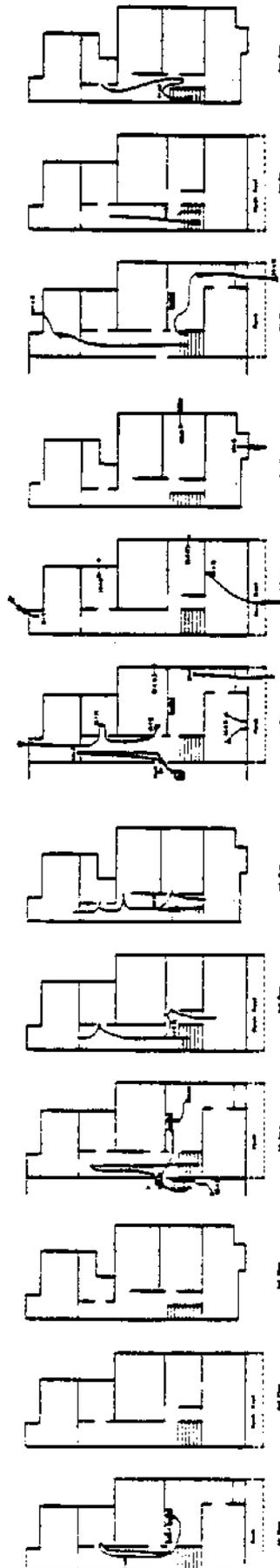
The District of Columbia Fire Department initial box alarm assignment of 4 engines, 2 trucks and a rescue squad arrived at 0101 hours to find a post flashover fire which had extended to all three floors with residents calling for help from room windows, the front porch roof and the roof of the building. The fire department personnel evacuated and rescued seven residents from the building, six were evacuated down fire department ladders. The fire was extinguished with four 1½ inch hose lines within fifteen minutes of arrival.

A total of eight residents suffered fatal injuries within the building with five residents being found on the second floor and three residents were found on the third floor. One resident rescued from the second floor died several days later in the Washington Hospital Center. There were thus a total of ten resident fatalities, and five residents suffered injuries requiring hospital medical treatment.

FIRE



PEOPLE



Realms 1,2,3,4, and Episodes 1,2,3,4

CONCLUSIONS

A. Behavioral Episodes

1. Failure of the resident detecting the fire to alert others or initiate the local alarm system (8) resulted in residents not being aware of the fire until the interior open stairway was untenable.

2. The prompt response of the resident in the 1717 duplex to suggest activation of the local alarm system (8) for this duplex unit facilitated the alerting of the 26 residents in this unit.

3. The adaptive behavior of the resident from the 1717 duplex unit to assist the blind resident on the first floor of the 1715 duplex unit improved her capacity to successfully evacuate.

4. The cooperation and assistance of residents in the same bedrooms of the 1715 duplex unit was directly responsible for the successful evacuation of four residents.

5. The effective response, attack, and rescue procedures of the District of Columbia Fire Department significantly reduced the potential property and casualty losses.

6. There appeared to be a lack of training in fire emergency procedures of the staff, and an apparent absence of fire evacuation drills.

B. Fire and Smoke Realms

1. The combustibility of the first floor lounge area furniture permitted the fire to rapidly propagate within the lounge area.

2. The open interior stairway with combustible interior finish allowed excessive amounts of heat and smoke to be transmitted throughout the 1715 duplex unit creating untenable conditions in these means of egress and propagating the fire immediately to the second and third floor levels.

3. The operational failure of the local alarm system (8) in the 1715 duplex unit hindered the prompt alerting of the residents in the unit. The operation of the local alarm system (8) in the 1717 duplex unit facilitated the evacuation.

4. The 2A rated (10), listed (13) portable extinguisher failed to operate as designed when its operation was attempted by the maintenance man.

5. The lack of available secondary means of egress resulted in the absence of any available means of egress once the interior open stairway became untenable.

6. The presence of combustible interior finish materials in the corridors and stairways allowed the fire to rapidly propagate in these areas upon exposure to the thermal column heat transmission from the first floor lounge area.

VIII. HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

1. Some surviving residents indicated upon being awakened by the smoke and heat, they did not expect to be able to escape from the structure in this fire incident.

2. The resident discovering the fire expected to be able to control and extinguish the fire with the jars of water, primarily due to the size of the flames on the sofa and the perception of the flames as representing a non-threatening fire.

B. Alternative Behavior Hypotheses

1. The selection of behavioral alternatives by staff personnel, appeared to reflect the apparent lack of staff training and their knowledge of appropriate fire emergency procedures.

41. UNIVERSITY NURSING HOME, APRIL 13, 1979

At approximately 0833 hours on April 13, 1979 the smoke detector located on the ceiling of the lounge area at the south end of the corridor of the South Section of B wing on the second floor activated, in the University Nursing Home, 901 Arcola Avenue, Silver Spring, Maryland. This detector was activated by a flow of convected heat and dark smoke from the door of patient room 27 approximately fifteen feet to the North. The activation of this smoke detector automatically initiated the activation of the local alarm system. The receptionist upon hearing the alarm and checking the annunciator panel immediately dialed 911 and notified the Montgomery County Emergency Operations Center at approximately 0833. While the Emergency Operations Center was dispatching the initial response from the Silver Spring and Kensington Fire Departments and the Wheaton Rescue Squad, they received another call from the receptionist at the home indicating a serious fire with heavy smoke conditions. An additional call was also received from a public utility company indicating one of their drivers had reported heavy smoke from the exterior of the home.

The nursing staff in the home responded and were able to close the doors to all the patient rooms in both the South and West Sections of B wing with the exception of the door to the room of fire origin, room 27. The room experienced flashover and the rapidly spreading heat and smoke forced the staff out of the area. The smoke barrier doors closed with the activation of the local alarm system and prevented the spread of smoke extensively to the West Section and in particular to A wing.

The first arriving engine company attacked the fire in room 27 after initiating a second alarm, with a 1-3/4 inch hose line up a ladder and in a window. Approximately twenty-one patients were removed from rooms 16 to 26 in the South Section by the fire department, seven of these down ladders. An additional twenty-six patients were evacuated from the West Section of B wing. Seventeen patients were transported to hospitals for medical treatment with eight staff members. Two of these patients subsequently died. One female, 92 years of age from room 16 died on April 16 of a heart condition and one female, 88 years of age from room 26 died on April 24 of complications from smoke inhalation.

The total fire department response involved three alarms with a total assignment of 9 engines, 4 trucks, 3 rescue squads, 5 ambulances and 3 paramedic units with a total personnel response of 113 personnel. The fire was reportedly extinguished within five minutes following the arrival of the first engine and within nine minutes of the activation of the smoke detector. The evacuation of the 21 patients

from the B wing was reported to have been completed within ten minutes of the arrival of the first engine. The total evacuation was completed within 25 minutes from the B wing in this two story protected noncombustible building. The fire was confined to the room of origin and the adjacent corridor area.

CONCLUSIONS

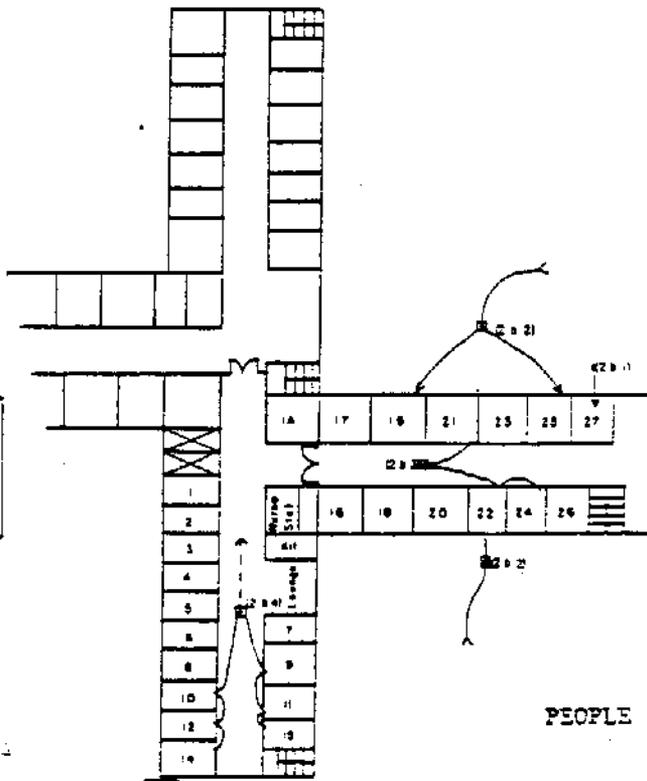
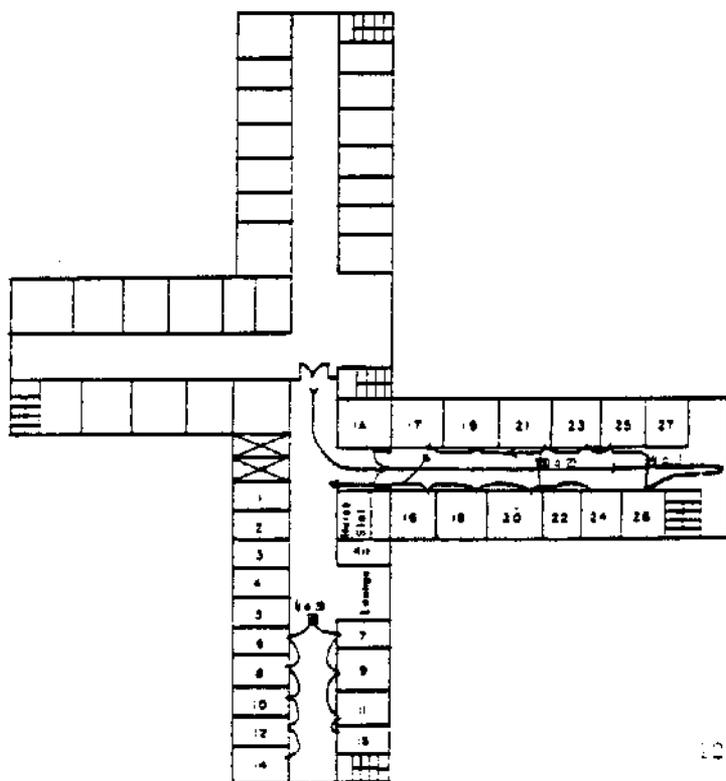
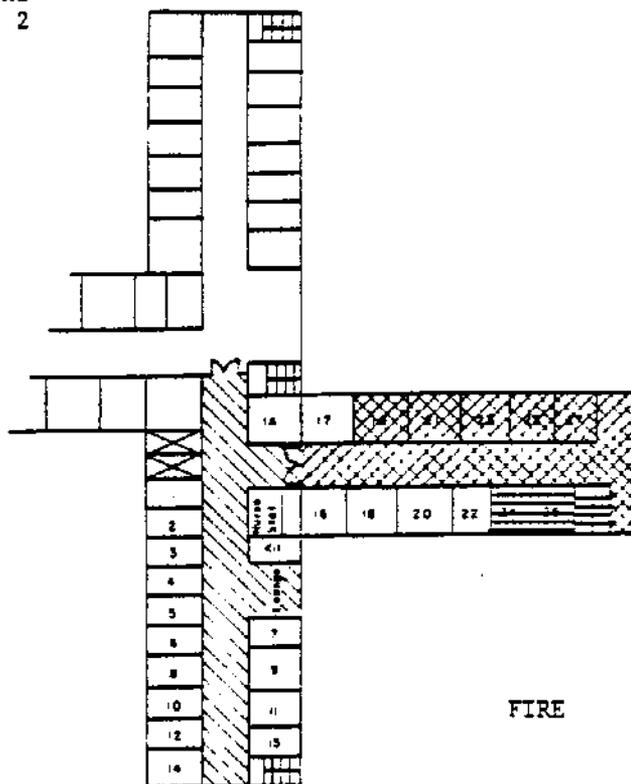
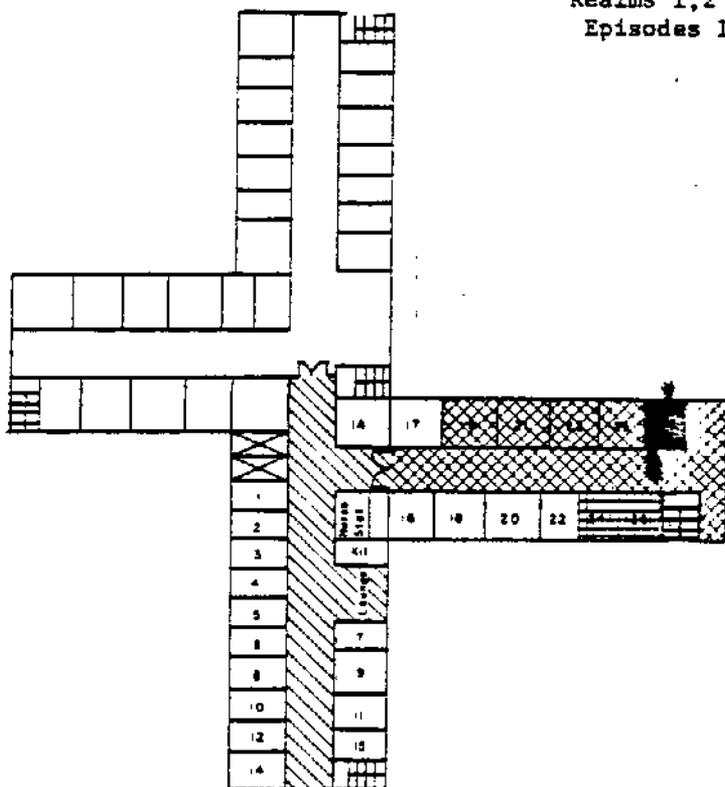
A. Behavioral Episodes.

1. The critical initial staff action of closing patient room doors resulted in the reduction of patient casualties. This adaptive action was performed in an efficient and affective manner by the nursing staff in a rapidly deteriorating and physically threatening environment.
2. The evacuation efforts of fire department personnel were dictated by the heavy smoke conditions throughout the B wing. These rescue procedures and evacuations were conducted to minimize the exposure of the patients.
3. The actions of the nursing staff with respect to the protection of the patients and alarm transmission were in conformance with the facility emergency procedures and appeared to have been determined by previous training.
4. The eight staff personnel transported to hospitals for medical treatment was evidence of the threatening conditions in which staff performed to protect the patients by closing room doors.

B. Fire and Smoke Realms.

1. The patient room door to room 26 performed as designed in maintaining a barrier between the flames and heat being expelled from room 27.
2. The smoke detector located in the lounge area detected the fire incident and activated the facility local alarm system as designed.
3. The smoke barrier doors between the area of fire origin and the remainder of the B wing and between the B wing and A wing functioned as designed.
4. The fire resistive assembly of the room of fire origin functioned as designed.
5. The transmission of heat and smoke through the door to room 27 allowed untenable smoke conditions to develop in the corridor of the South Section of the B wing, second floor.

Realms 1,2 and
Episodes 1, 2



PEOPLE

42. KENSINGTON GARDENS NURSING HOME, APRIL 14, 1979

This fire incident at the Kensington Gardens Nursing Home on April 14, 1979 was initially detected by a nurse on the first floor, central wing as an odor of smoke in the corridor adjacent to room 123, at approximately 0115. The nurse detected smoke in room 123 and observed smoke issuing from an electrical unit heater in the room. The nurse immediately disconnected the electrical power cord to the heater from the wall socket and evacuated the single female patient in her bed from the room, along the corridor beyond the smoke barrier doors to the new section.

During the evacuation of the patient other nursing staff were alerted, the local alarm system activated, the facility emergency procedures initiated and the Montgomery County Emergency Operations Center notified. The Kensington and Silver Spring Volunteer Fire Departments responded, verified extinguishment and conducted ventilation operations. The patient and one nursing staff member were transported by ambulance to the hospital for medical observation and examination as a precautionary measure.

There was no fire damage beyond the electrical unit heater in this two story, fire resistive original section of the facility constructed approximately 32 years ago.

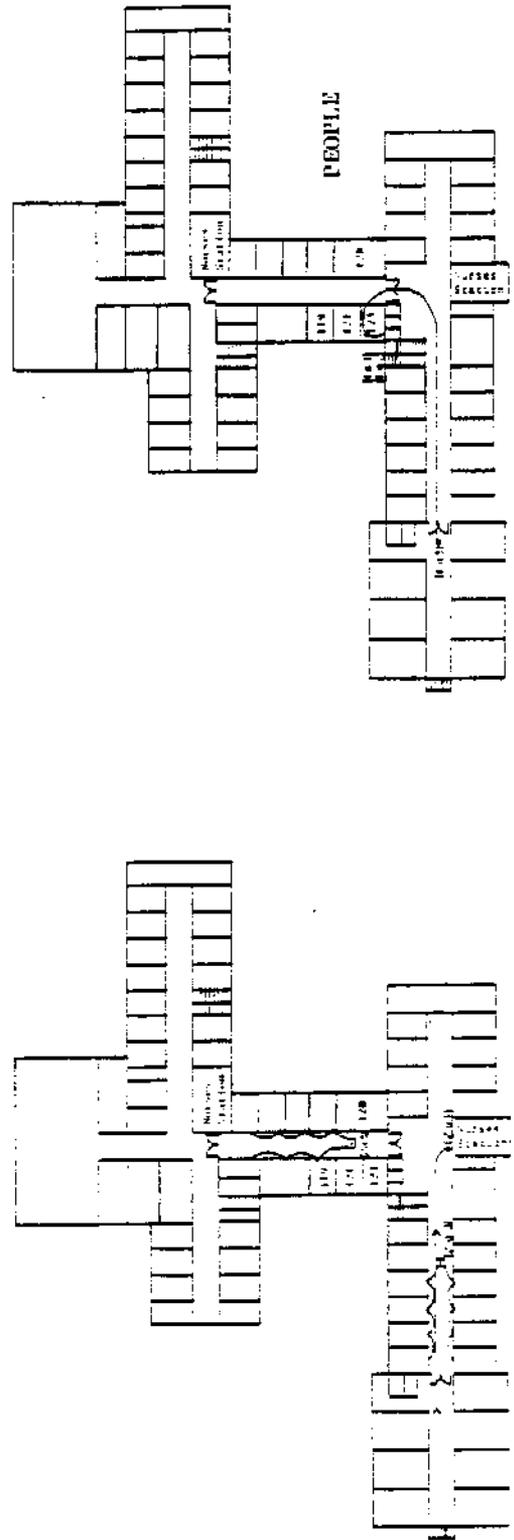
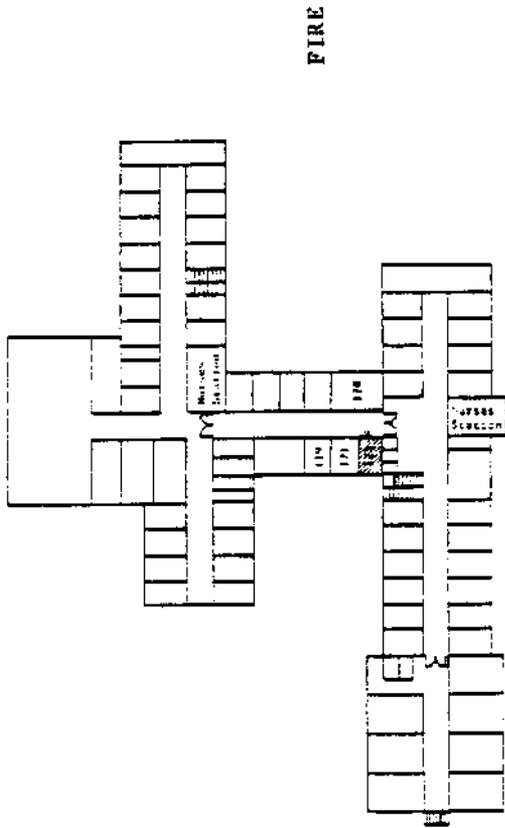
CONCLUSIONS

A. Behavioral Episodes.

1. The initial adaptive actions of the nursing staff in disconnecting the electrical power to the heater and evacuating the patient were effective in preventing injury to the patient and reducing the fire threat.
2. The alarm and confinement behavior were conducted in accordance with the facility emergency procedures as developed in the training sessions.

B. Fire and Smoke Realms.

1. The local fire alarm system, (9) and the smoke barrier doors functioned as designed.
2. There was no reported smoke detector or automatic sprinkler activation in this fire incident.



Realm 1 and Episode 1, 2

43. THURSTON HALL DORMITORY, APRIL 19, 1979

This fire incident occurred on the fifth floor of Mabel Nelson Thurston Hall, George Washington University, 1900 F Street, N.W., Washington, D.C., on April 19, 1979. The fire incident was initially detected by a student who investigated an abnormal noise followed by smoke issuing from the corridor into the room 501, occupied by the student. The student opened the room door and observed the corridor was involved in fire. Other students were awakened by abnormal noises or the smell of smoke. Many students attempted to evacuate through the corridor, while others waited for rescue in their rooms, while two students jumped and incurred serious injuries. The fire department received the alarm at 0348.

The District of Columbia Fire Department arrived with a box alarm assignment consisting of 4 engines, 2 trucks and a rescue squad, after flashover had occurred in the corridor of the fifth floor. Upon arrival fire department personnel found students calling for help from their dormitory room windows. Aerial ladders were raised by the truck companies on the North and East sides of the building, and students evacuated from the building. The fire in the fifth floor, north and west corridor and room 533 was extinguished with one 1-1/2 inch hose line off the standpipe system in the Northwest stairway.

Smoke permeated the top half of the building, floors five through nine, which hindered prompt evacuation of the building.

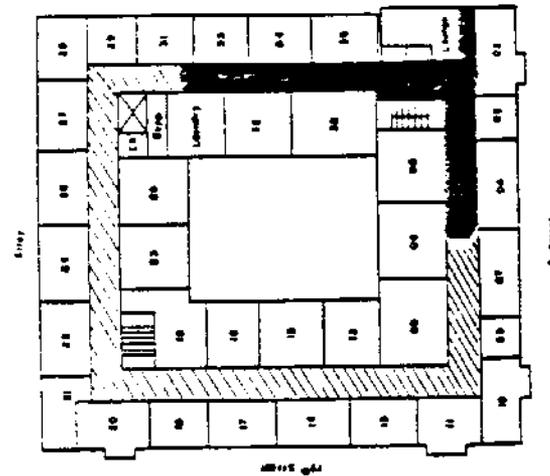
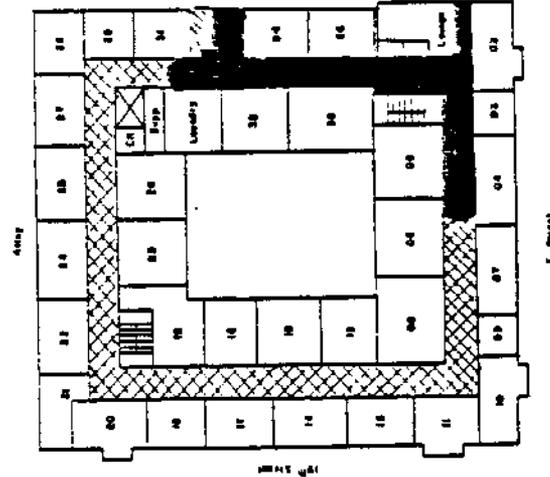
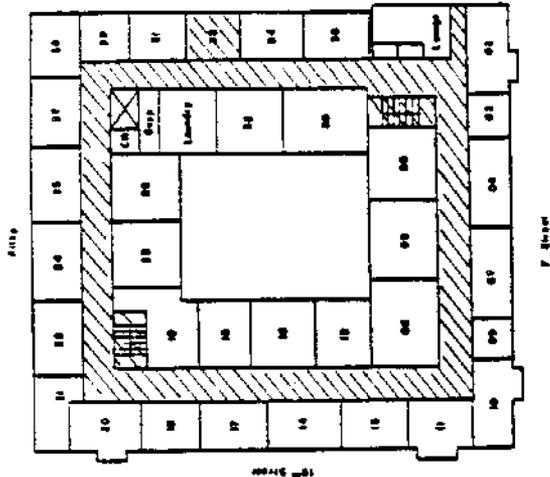
A total fire department response of one box alarm and three special assignments was required to assure the evacuation of 898 students and University staff residing in the building. Approximately 37 occupants required emergency medical treatment, 15 occupants were admitted to hospitals.

CONCLUSIONS

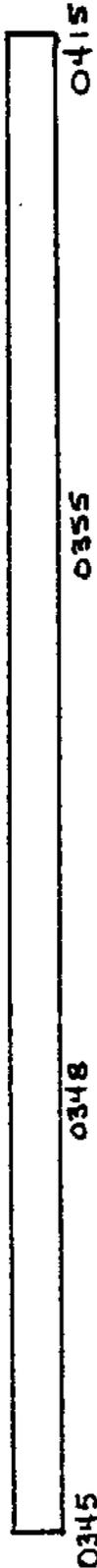
A. Behavioral Episodes.

1. The occupants tended to attempt to obtain information to assess the validity of the activation of the local alarm system (9) and to structure the situation relative to the perceived threat to their safety. The most desired information appeared to be related to the involved personal risk and the need for immediate evacuation.
2. The occupants appeared to initiate evacuation behavior upon the perception of the validity of the local alarm system activation (9) by the secondary reinforcement fire cues of smoke or smoke odor.

Realm 1, 2, 3 and Episode 1, 2, 3



FIRE

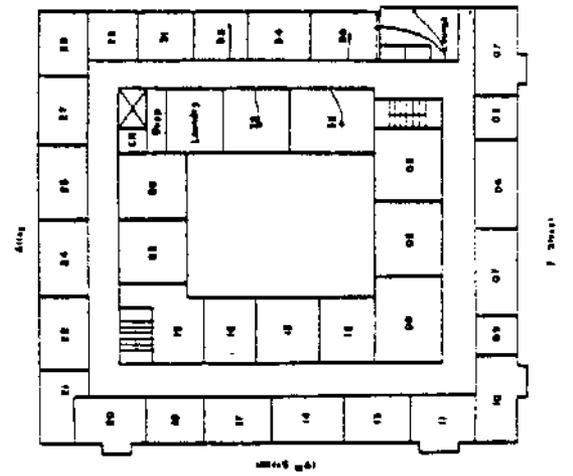
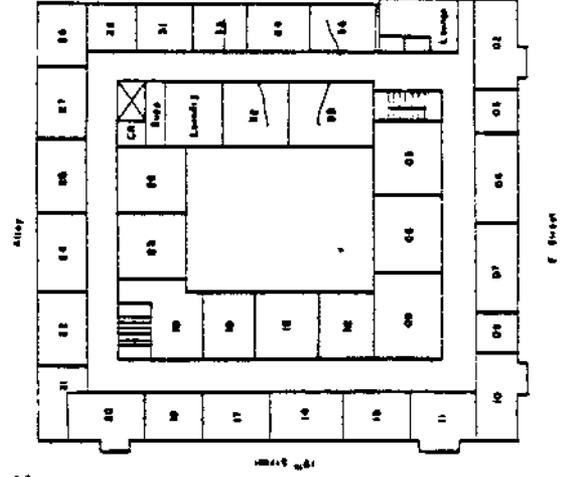
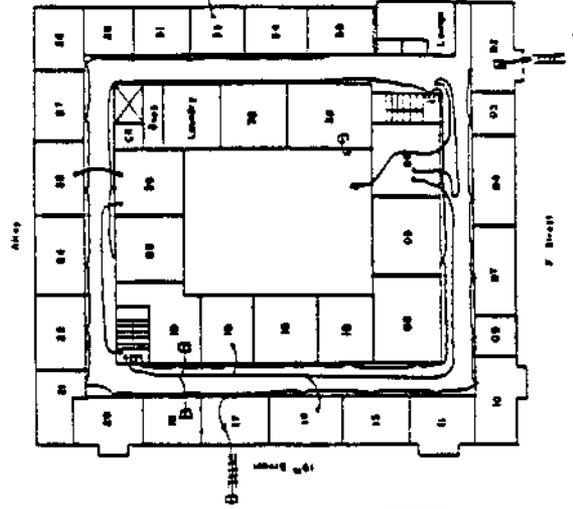


0415

0355

0348

0345



PEOPLE

3. Occupants traversed through smoke in both successful and unsuccessful evacuation behavior.

4. There was some evidence of anxiety reducing behavior characterized by extreme verbalizing induced by unsuccessful evacuation attempts.

5. Occupants evacuating from the same room had varying levels of success in their evacuation efforts.

6. Both occupants who fell from the fifth floor, had experienced unsuccessful evacuation attempts, in this fire incident, which resulted in burns to the occupants.

B. Fire and Smoke Realms.

1. The fire rapidly propagated approximately three fourths the length of the west corridor and approximately one half the length of the north corridor.

2. The fire propagated into room 533 from the corridor due to the open door.

3. The thermal column effect in the building created by the fire temperatures appeared to contribute to the extensive smoke spread in the corridors on the floors above the fire floors.

4. The stairways were permeated with smoke on the upper levels due to the continual opening of the stairway doors at the fifth floor for evacuation and extinguishment purposes.

5. The fire resistive construction of the structure with the fire resistive rated interior partitions effectively retarded the extension of the fire from the corridor areas of origin and room 533.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectations Hypotheses.

1. Personnel appeared to interpret the local fire alarm system abbreviated activation as a false alarm not requiring evacuation preparation or initiation due to the conditioning effect of numerous false alarms in the facility.

2. Personnel appeared to not expect the rapid propagation of heat and smoke along the fifth floor corridor with the experienced velocity of heat flow and the smoke density. Their expectation of the smoke and heat propagation appeared to have been formulated from nonthreatening fire experiences.

3. Personnel appeared to not expect to experience flames and heat in the fifth floor corridor. Their expectation of evacuation travel appeared to have been developed from the numerous evacuations during the previous false alarms.

4. The personnel involved in evacuation by "jumping", appeared less selective in the personal injury risk involved in the behavior.

(The occupants who fell from the fifth floor appeared to not perceive the personal injury risk involved in the behavior. Both occupants received burns in prior unsuccessful attempts to evacuate from their rooms.)

B. Alternative Behavior Hypotheses.

1. Personnel involved in evacuation by jumping or dropping from upper floors had previously attempted the behavioral alternatives of evacuation through the corridor unsuccessfully.

2. The verbal suggestions of other personnel appeared to be a critical factor in the jumping behavior in one situation.

3. Personnel involved in evacuation by jumping or dropping from upper floors apparently rejected the behavioral alternatives of using the bathroom as an area of refuge.

4. NATIONAL INSTITUTES OF HEALTH CLINICAL CENTER, APRIL 21, 1979

This fire incident at the National Institutes of Health Clinical Center on April 21, 1979 was detected by a pharmacy Technician on the ninth floor, west pediatrics nursing unit with the visual observation of smoke in the solarium lounge at approximately 1502. The Technician immediately notified the charge nurse. The local alarm system (9) was activated, which automatically (13) transmitted an alarm to the National Institutes of Health Fire Department. The fire department also received a phone call verifying the alarm from the nursing unit.

Four ambulatory patients and two visitors were evacuated by the nursing staff and one ambulatory patient was evacuated by maintenance personnel. Bethesda Fire Department personnel rescued one nonmobile infant. The Clinical Center was evacuated from the fourteenth through the third floors of approximately 184 patients and 50 visitors primarily by staff and NIH personnel in approximately 55 minutes. Relative to the 184 patients, 118 were ambulatory, 46 were evacuated in wheelchairs, and 20 in beds. A total of seven persons were hospitalized for medical observation or treatment: four fire department personnel, one police officer, one visitor and one patient.

The initial response by the National Institutes of Health Fire Department consisted of one engine and one ambulance with 5 personnel. The fire was extinguished by Bethesda Fire Department personnel with one 2 inch hose line from the standpipe system in stairway 7, in approximately 20 minutes. The total second alarm fire and rescue response from Montgomery County involved 5 engines, 5 trucks, 2 rescue squads, 2 paramedic units and 4 ambulances with approximately 70 fire and rescue personnel.

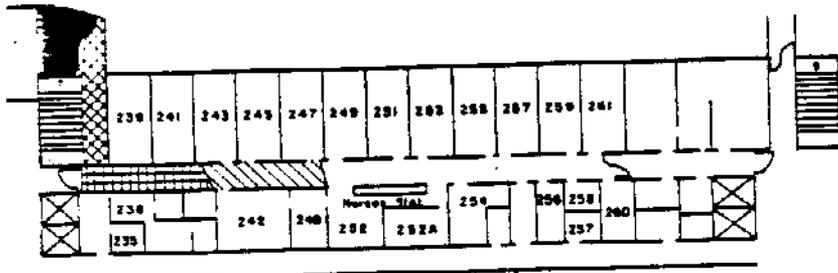
The fire damage in this 26 year old fire resistive building was limited to the solarium lounge and the corridor of the 9 west nursing unit.

CONCLUSIONS

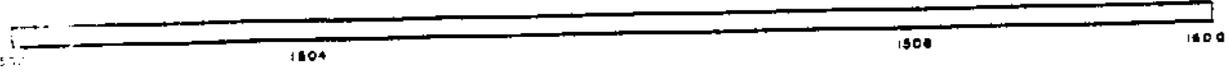
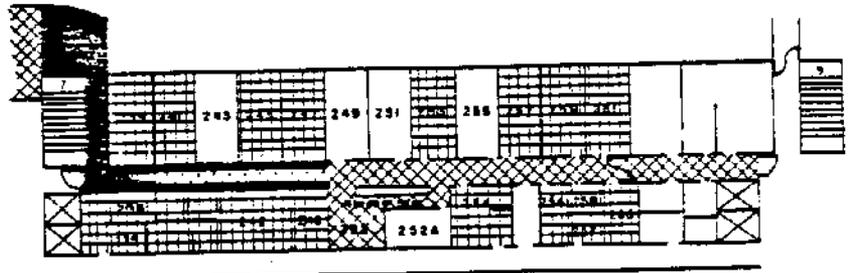
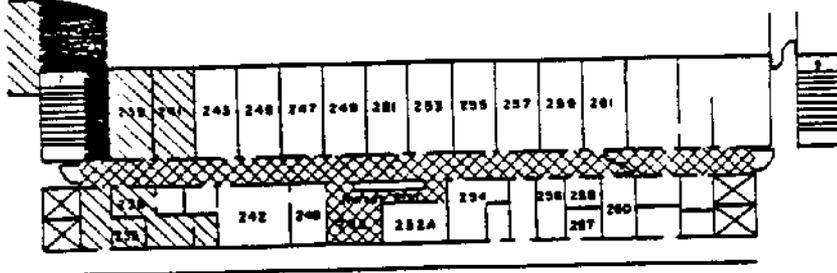
A. Behavioral Episodes.

1. The alarm and reporting procedures initiated by the staff of the 9 west nursing pediatrics unit were effective and in conformance with the facility emergency procedures.

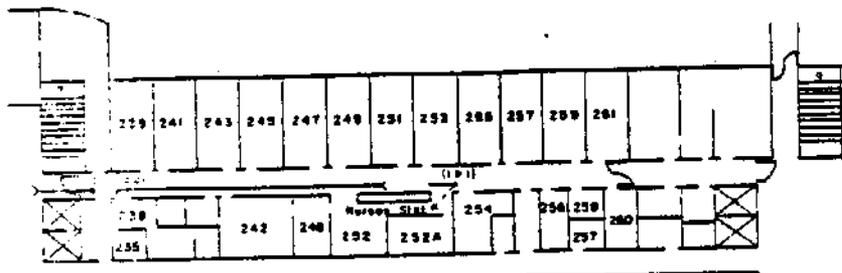
2. The evacuation of the patients from the 9 west nursing pediatrics unit by staff personnel was performed in a rapidly deteriorating and physically threatening environment.



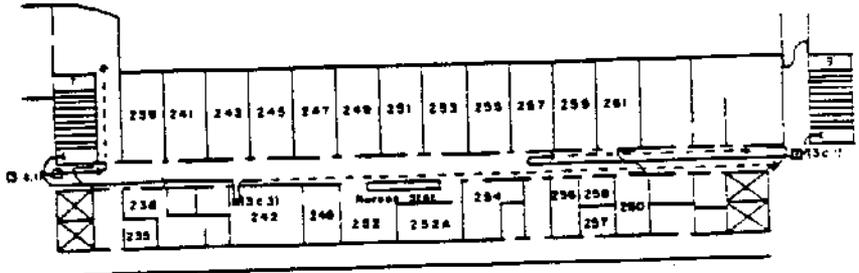
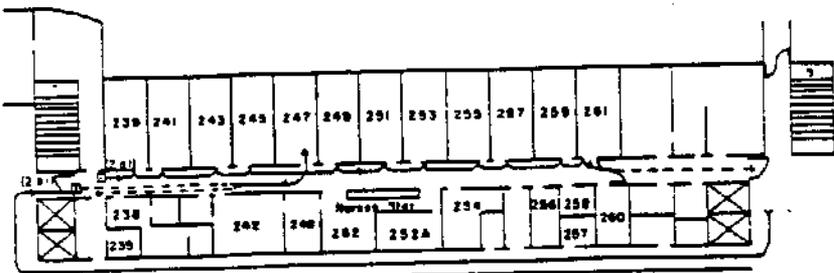
FIRE



Realms 1, 2, 3
and Episodes 1, 2, 3



BEHIND



3. The evacuation of 184 patients was accomplished in approximately 55 minutes from the third through the fourteenth floors in an effective and efficient manner with no interference with the necessary patient support, treatment, or medications.

4. The fire department's continued practice of standard search and rescue techniques resulted in the rescue of the 55 day old female patient from the neonatal nursery, room 242.

a. The oxygen support unit of the 55 day old infant provided an effective area of refuge.

b. The closed door to room 242 and the fire resistive room construction prevented untenable heat conditions within the neonatal nursery.

5. The three previous "page 100" announcements in the Clinical Center building prior to the fire incident, and the frequency of such incidents appeared to condition some staff personnel to adapt a non-response mode to the announcements.

6. The hospital medical treatment received by four fire department personnel and one police officer is evidence of the threatening environment in which these personnel performed in this fire incident.

7. The effectiveness of the personnel evacuation was demonstrated by hospital medical treatment being required for only one patient and one visitor.

B. Fire and Smoke Realms.

1. The fire resistive construction of the building retarded and prevented fire spread from the 9 west nursing unit.

2. The 1½ hour fire resistive rated doors (16) retarded smoke spread and the east door from the 9 west nursing unit prevented fire spread to the main lobby area and the 9 east nursing unit.

3. The local alarm system (9) with the proprietary system (13) connection to the N.I.H. Fire Department functioned as designed.

4. The standpipe systems (12) in the Clinical Center were properly maintained and functioned as designed.

5. The transmission of heat and smoke through the door to the solarium lounge allowed untenable smoke conditions to develop in the corridor of the 9 west pediatrics nursing unit.

6. The air conditioning and ventilation system with the use of the corridors as return air plenums apparently facilitated the smoke propagation from the 7th through the 14th floors in the building.

VIII. HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between

phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses.

1. Personnel appear to interpret the verbal fire alarm public address system announcement as a routine announcement not requiring patient protection, evacuation preparation or evacuation initiation due to the conditioning effect of numerous announcements in the facility.

(Three previous "page 100" announcements had been initiated in the Clinical Center on April 21, 1979, one less than 20 minutes prior to the fire incident.)

2. Personnel appeared to not expect the rapid propagation of heat and smoke from the lounge area with the experienced velocity of flow and the smoke density to force them from the nursing unit. Their expectation of the smoke and heat propagation appeared to have been formulated from nonthreatening fire experiences.

B. Alternative Behavior Hypotheses.

1. Nursing personnel appear to select behavior which offers the most benefit and protection to the patients from the threat of fire and smoke.

(Facility personnel did not select the options of use of the fire extinguishers, or immediate withdrawal from the fire zone, the 9 west nursing unit. The option selected was the evacuation of the patients and the closing of patient room doors.)

2. Training and the perception of a threatening fire appeared to affect the selection of behavioral alternatives by staff personnel.

(Facility personnel in the fire zone exposed to smoke and heat initiated patient evacuation and closed patient room doors as the trained response to the perception of the fire threat.)

45. ROOSEVELT HOTEL, APRIL 24, 1979

This fire incident occurred on the eighth floor of the Roosevelt Hotel, 2101 Sixteenth Street, N.W., Washington, D.C. on April 24, 1979. The fire incident was initially detected by a resident on the eighth floor who detected an odor of smoke and phoned the Hotel receptionist. The Hotel receptionist phoned the building engineer in the basement and the fire department. The fire department received the notification of the fire from the receptionist at 0701 hours.

The District of Columbia Fire Department arrived with a box alarm assignment consisting of 4 engines, 2 trucks and a rescue squad, after flashover had occurred in the room of fire origin, room 818, with extensive smoke throughout the eighth floor corridors. The fire was extinguished with one preconnected 1½ inch hose line by the first due engine company, located 1½ blocks away.

The fire department evacuated the eighth floor with personnel providing assistance to some residents from their breathing apparatus. The fire damage was limited to the room of origin, and smoke propagation to the eighth floor, of this fire resistive constructed building.

A total second alarm fire department response was required to assure the evacuation of the residents. One resident, the sole occupant of room 818 was fatally injured, and four other residents received medical treatment at hospitals. Two of the injured residents from the eighth floor were treated for smoke inhalation and two residents from other floors were treated for chest pains.

CONCLUSIONS

A. Behavioral Episodes

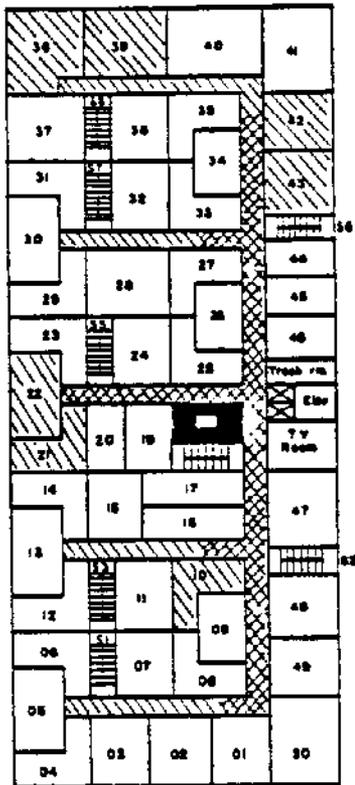
1. Few occupants tended to attempt to obtain information to structure the situation relative to the perceived threat to their safety due to the ambiguous cues.

2. Occupants traversed through smoke in both successful and unsuccessful evacuation behavior.

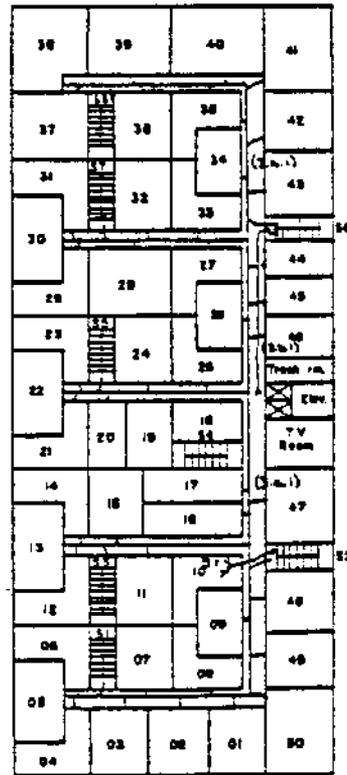
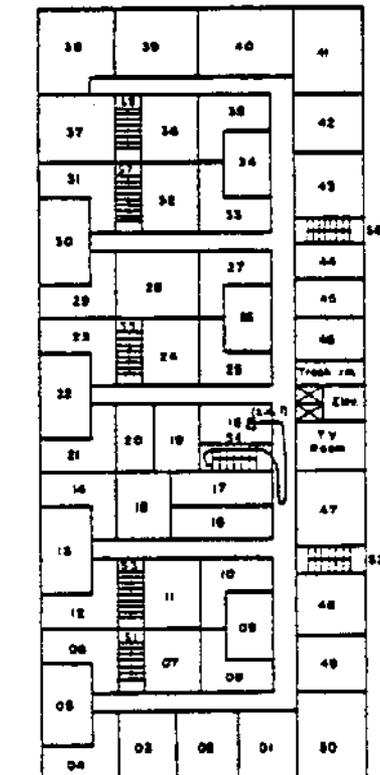
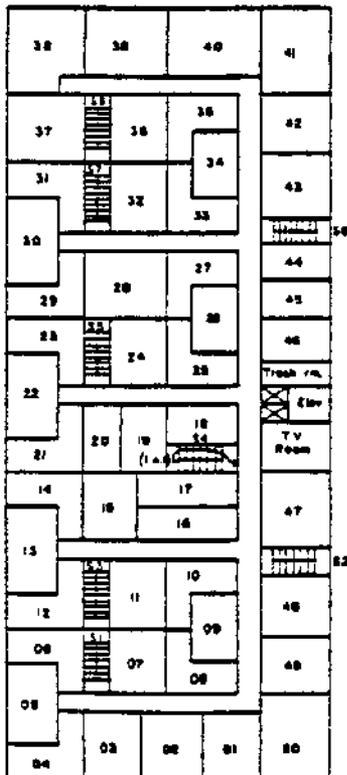
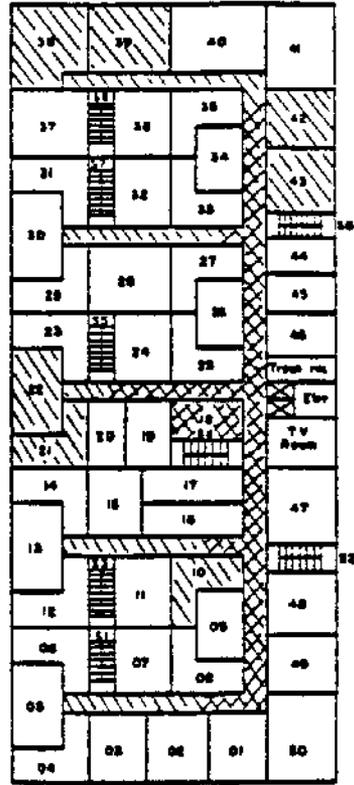
3. The effective and efficient extinguishment of the fire in room 818 by fire department personnel, using one 1½ inch preconnected hose line is attributed to preplanning and training.

4. The evacuation behavior of the two residents who did not wait in their rooms for the fire department assistance appeared to have been influenced by the perception of the smoke in the corridor as non-threatening and previous experience in fire incidents.

Realms 1, 2 and Episodes 1, 2, 3



FIRE



PEOPLE

B. Fire and Smoke Realms

1. The propagation of the smoke throughout all of the eighth floor corridors and into resident rooms appeared to be influenced by the type of room doors and the clearance around the room doors.
2. The 1 hour fire resistance construction of the room partitions restricted the fire spread to the room of origin, room 818.
3. The location of the fire on the top floor of the building limited the propagation of heat and smoke to other floors.
4. The delayed activation of the local alarm system (8) was a primary factor in most residents being alerted to the fire incident by other means.

VIII. HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study:

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

1. Most of the residents appeared to expect control of the fire incident due to their concept of the professional competence of the fire department and their previous experience with fire incidents at this facility.

B. Alternative Behavior Hypotheses

(Residents were told to remain in their rooms, in this incident and previous situations, and thus utilized their rooms as areas of refuge until a fire fighter came to evacuate them to lower floors.)

1. The selection of behavioral alternatives by residents, appeared to be primarily influenced by their knowledge from previous experience with fire incidents in this facility.

46. MT. WILSON HOSPITAL CENTER, JUNE 10, 1979

This fire incident at the Mount Wilson Hospital Center on June 10, 1979 was initially detected by a Health Assistant who perceived a smoke odor on the second floor of the Ritchie Building at approximately 1837 hours. The Health Assistant immediately directed the residents to evacuate and called to other staff for assistance. The arriving staff observed the smoke conditions in the corridors and activated the local alarm system (9) and phoned the first floor staff to initiate the Hospital fire emergency procedures which include notification of the Baltimore County Fire Department.

The Hospital Center security staff responded to the area of fire origin, room 205 and a security guard suppressed the mattress flames with a five pound dry chemical listed (15) extinguisher, rated 2A, 10BC (11). Damage was limited to the room of origin with smoke limited to two of the four smoke zones on the second floor of the protected ordinary construction building erected approximately fifty years ago.

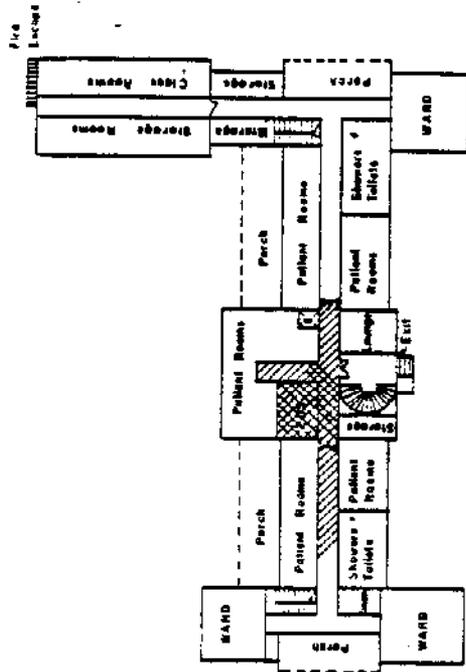
All fifty-one of the residents of the Ritchie Building were evacuated without staff assistance and without injury. The Baltimore County Fire Department responded and completed extinguishment of the mattress fire with one 1½ inch hose line, and ventilated the second floor fire zone with fans placed in opened windows.

CONCLUSIONS

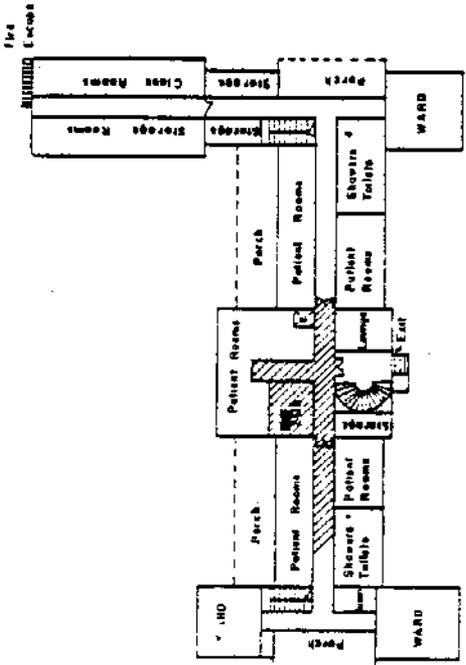
A. Behavioral Episodes

1. The Health Assistant initiated the resident evacuation immediately upon perception of the ambiguous smoke odor cue.
2. Staff personnel investigated to verify and confirm the existence of a threatening fire prior to activation of the local alarm system (9), and initiation of the facility fire emergency procedures.
3. The evacuation of the building was enhanced by the mobility characteristics of the residents.
4. The utilization of the five pound, listed (15) dry chemical, 2A, 10BC rated (11) extinguisher by the security guard to achieve suppression of the mattress flames appeared to be the result of previous training

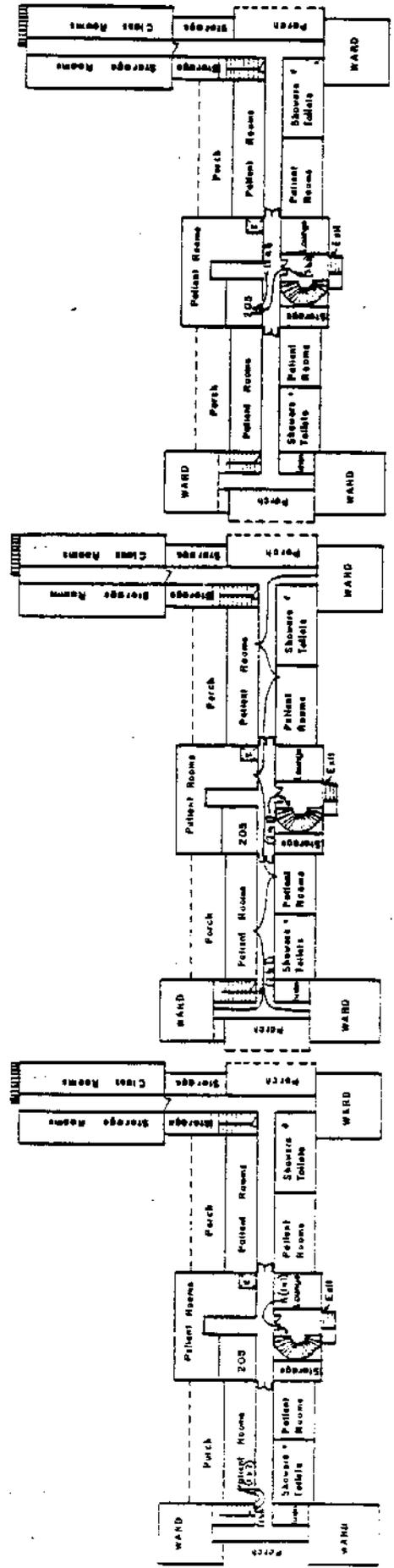
Reams 1, 2 and Episodes 1, 2, 3



FIRE



PEOPLE



B. Fire and Smoke Realms

1. The fire was limited to the mattress and a nearby pile of rags by the physical separation of these materials from other combustibles and through the application of the extinguisher.
2. The smoke was able to readily spread throughout the fire zone due to the door of room 205, the room of origin being open.
3. The five pound, listed (15) dry chemical extinguisher, rated 2A,10BC (11) was properly charged and operated as designed.
4. The local alarm system (9) functioned properly, as designed.
5. The smoke barrier doors in the Ritchie Building operated as designed, closing with the activation of the local alarm system.
6. None of the sprinkler heads in or adjacent to room 205 on the wet pipe automatic sprinkler system (8) were activated in this fire incident.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participant's in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

(The application of the five pound, listed (15) dry chemical, 2A,10BC rated (11) extinguisher on the mattress fire suppressed the flames.)

1. Security personnel appeared to expect the application of the dry chemical extinguisher to control the mattress fire, due to their previous fire experience at the facility and the extinguisher training with the fire department.

(The Health Assistant initiated the resident evacuation immediately upon perception of the ambiguous smoke odor cue.)

2. Staff personnel appeared to expect the perceived smoke odor to indicate a fire incident occurrence, due to previous training.

B. Alternative Behavior Hypotheses

(The Health Assistant directed residents to evacuate immediately upon perceiving the smoke odor.)

1. The alternative behavior of evacuation prior to confirmation and verification of the fire incident appeared to have been determined by the staff concern for the benefit and protection of the residents.

47. BETHESDA HEALTH CENTER, JUNE 12, 1979

This fire incident at the Bethesda Health Center on June 12, 1979 was automatically detected with the activation of a sprinkler head on the wet pipe system. (8) Water from the sprinkler head operated the water flow switch, thereby activating the local alarm system (9) and extinguished the fire in the laundry cart. The nursing supervisor proceeded through the facility attempting to locate the source of the waterflow alarm. The water flow activation of the sprinkler system is not indicated on the annunciator panel and she continued to search and noted smoke and water in the vicinity of the first floor laundry room.

She reported the occurrence of the fire incident by dialing the 911 emergency number of the Montgomery County Emergency Operations Center and then continued to monitor the status of all areas of the facility.

Two patients were evacuated from their room in an adjacent area to a neighboring room in wheelchairs for precautionary purposes because of a small amount of smoke and water in the vicinity of their room.

The fire was limited to a laundry cart and the smoke was limited to the proximity of the laundry storage room. The Bethesda Fire Department verified extinguishment, performed ventilation, salvage, and overhaul operations, including resetting of the alarm and sprinkler system.

CONCLUSIONS

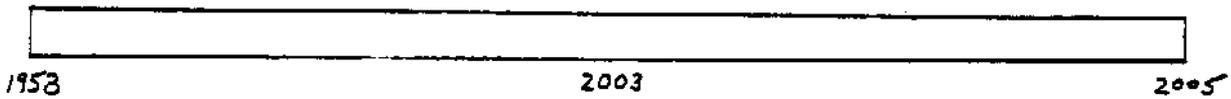
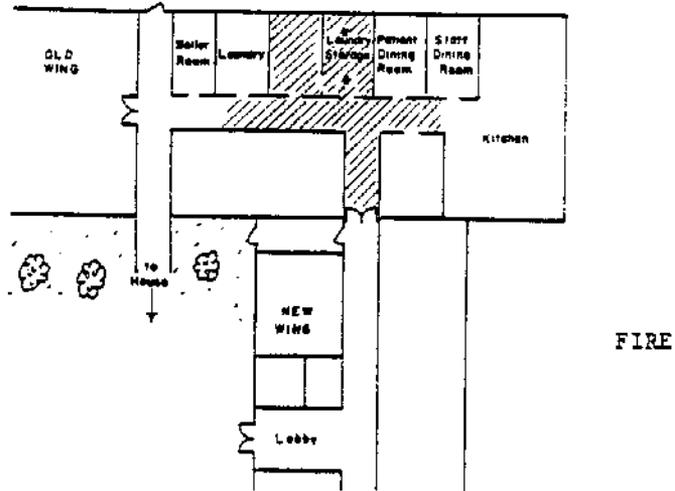
A. Behavioral Episodes

1. The nursing staff acted effectively and efficiently in conformance with the facility emergency plan by protecting the patients in their rooms behind closed doors, upon activation of the local alarm system (9) from the sprinkler system (8).

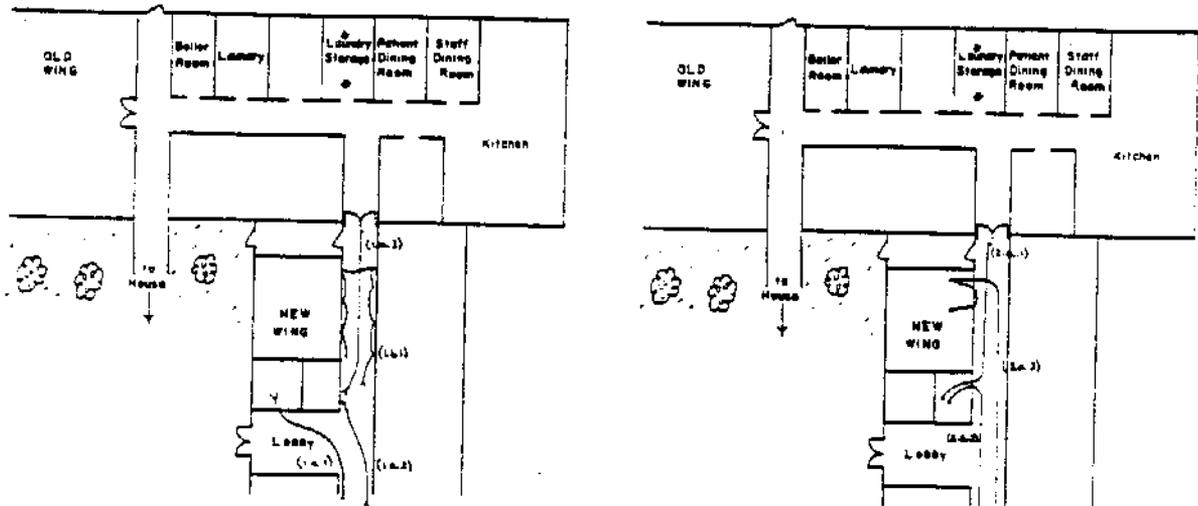
2. The evacuation of the two patients from the adjacent area was performed on a non-emergency basis, primarily as a precautionary action.

3. The nursing supervisor's knowledge of the alarm being initiated by the sprinkler system water flow switch upon observing no indication on the annunciator panel was the result of previous training and experience.

Realm 1, and Episode 1, 2



PEOPLE



3. Fire and Smoke Realms

1. The automatic sprinkler system (8), the local alarm system (9), the remote station system connection (12) and the smoke barrier doors functioned effectively as designed.

2. The lack of an indication of the sprinkler system (8) activation on the annunciator panel for the local alarm system (9), created some delay in determining the location of the fire incident.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

(The lack of indication on the annunciator panel indicated activation of the wet pipe sprinkler system. (8))

1. The nursing supervisor expected the activation of the local alarm system (9) to have been initiated by the sprinkler system due to her training and previous experience.

(The nursing supervisor initiated the evacuation of two patients from an adjacent area as a precautionary measure.)

2. Staff personnel appeared to expect the local alarm activation (9) to indicate a fire incident occurrence, due to previous training, with their concern for the benefit and protection of the residents.

3. Alternative Behavior Hypotheses

(The nursing staff moved patients into their rooms and closed the room doors.)

1. The alternative behavior of protecting the patients in their rooms by closing of room doors appeared to have been determined by the staff conformance with the facility emergency plan, and their expectation of control of the fire by the sprinkler system.

48. FRANKLIN SQUARE HOSPITAL, JUNE 13, 1979

This fire incident at the Franklin Square Hospital on June 13, 1979 was initially detected at approximately 1026 by a nurses aide who observed smoke issuing from under the door of the vacant patient room 3113. The nurses aide immediately activated the local alarm system (9), and the hospital operator initiated the verbal announcement on the public address system to activate the hospital emergency procedures. The operator also immediately notified the Baltimore County Fire Department via the direct private phone.

Patient room doors were closed by the nursing staff throughout the three-central fire zone. Two members of the hospital fire brigade entered the room of fire origin, room 3113, and extinguished the fire in a cotton, boric acid treated mattress. The fire brigade members then removed the mattress through the window of room 3113.

Damage was limited to the mattress, with smoke spread from room 3113 in both corridors of the three-central area. No patients were evacuated and there was no fire damage beyond the room of origin to this three story, fire resistive building constructed in 1977. The Baltimore County Fire Department responded, verified extinguishment of the mattress, and assisted the staff in ventilation of the third floor of the facility.

CONCLUSIONS

A. Behavioral Episodes

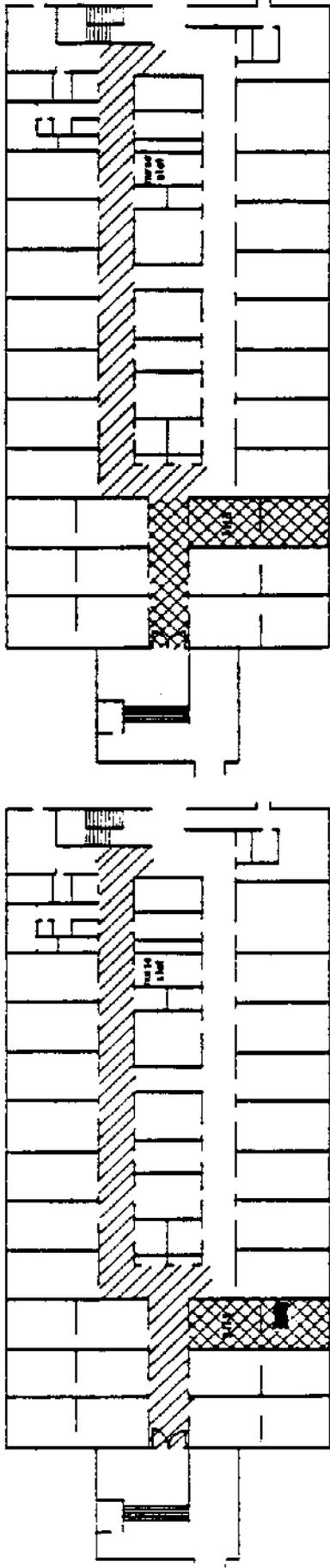
1. The nurse's aide immediately activated the local fire alarm system (9) upon the perception of the initial physical cues of the smoke issuing from under the door of patient room 3113.
2. The closing of the patient room doors by the nursing staff effectively provided areas of refuge for the patients, thereby eliminating the need for their evacuation from the Three-Central area in this fire incident.
3. Facility fire brigade personnel actions in the use of the two, five pound listed (11) all purpose, rated 2A, LOBC (11), extinguishers to suppress the fire appeared to be the result of previous training.
4. The facility fire brigade personnel actions to remove the mattress via the open window appeared to be the result of previous training and experience in the volunteer fire service.

B. Fire and Smoke Realms

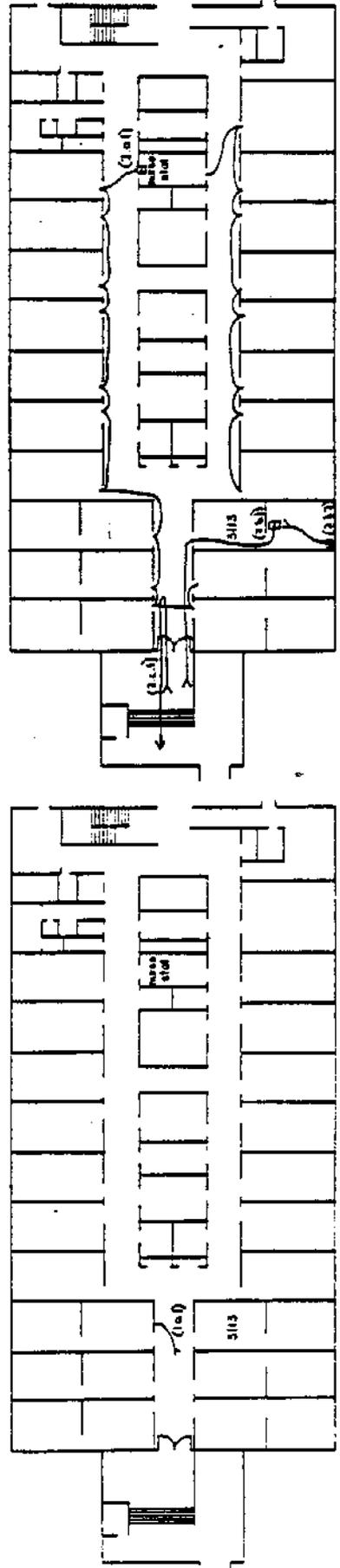
1. The majority of the smoke was limited to the corridors of Three-Central due to the patient room doors maintaining the patient rooms in the Fire Zone as tenable.

Realms 1, 2 and Epinodes 1, 2

FIRE



PEOPLE



2. The five pound listed (14) all purpose, rated 2A, 10BC (11) extinguishers were properly charged and operated as designed.

3. The cotton mattress was ignited and sustained combustion, despite its treatment with boric acid.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participant's in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

1. Nursing personnel appeared to interpret the activation of the local alarm system (9) as a routine event until the reinforcing observation of smoke.

2. The facility fire brigade personnel appeared to expect their actions to control and suppress the fire due to their previous facility and volunteer fire service training and their previous fire incident experience in volunteer fire departments.

B. Alternative Behavior Hypotheses

(The nurses aide immediately activated the local fire alarm system, upon observing the smoke issuing from under the door of patient room 311B.)

1. The detection reaction of nursing personnel in the selection of the alarm initiating behavior, instead of the alternative of investigating the source of the smoke within the room, appeared to have been influenced by the training with the emphasis on closing patient room doors.

2. The selection of behavioral alternatives by nursing personnel, appeared to be primarily influenced by the training and their knowledge of the facility emergency procedures.

49. MARYLAND MASONIC HOME, JUNE 21, 1979

This fire incident at the Maryland Masonic Home on June 21, 1979 was detected by a housekeeper upon entering resident room 116 at approximately 0910 and observing a light accumulation of smoke at the ceiling. The housekeeper turned on a window fan in the unoccupied room to remove the smoke, and left the room closing the door, to report the smoke. The housekeeper reported the smoke to the administrator who immediately ordered the fire department to be notified. The housekeeper and the administrator returned to room 116 to investigate the source of the smoke. Upon opening the closet doors flames involving the contents evolved. The administrator ordered evacuation of the first floor and the assistant administrator extinguished the fire with the application of two, five pound, listed (15) dry chemical extinguishers, rated 2A, 10BC. (11)

Three residents from the adjacent section A of the first floor were assisted in their evacuation by staff. Most of the residents of this facility were already outside the building due to a schedule field trip and approximately eighty per cent of the residents are ambulatory.

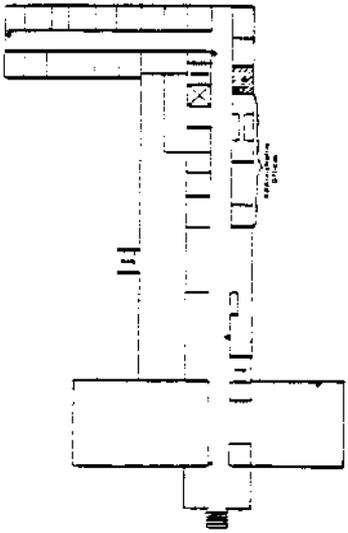
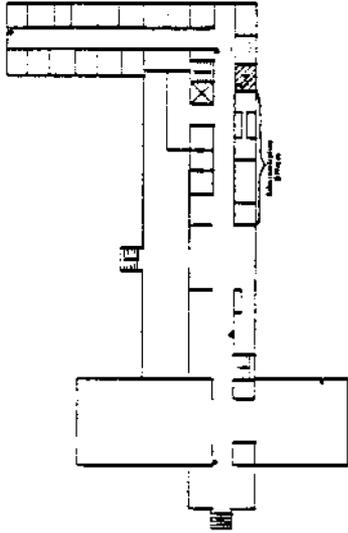
The fire and smoke effects of this fire incident were primarily limited to room 116 in this 100 bed facility of fire resistive construction, erected in 1934. The Baltimore County Fire Department responded and verified extinguishment with overhaul operations, and also conducted ventilation procedures.

CONCLUSIONS

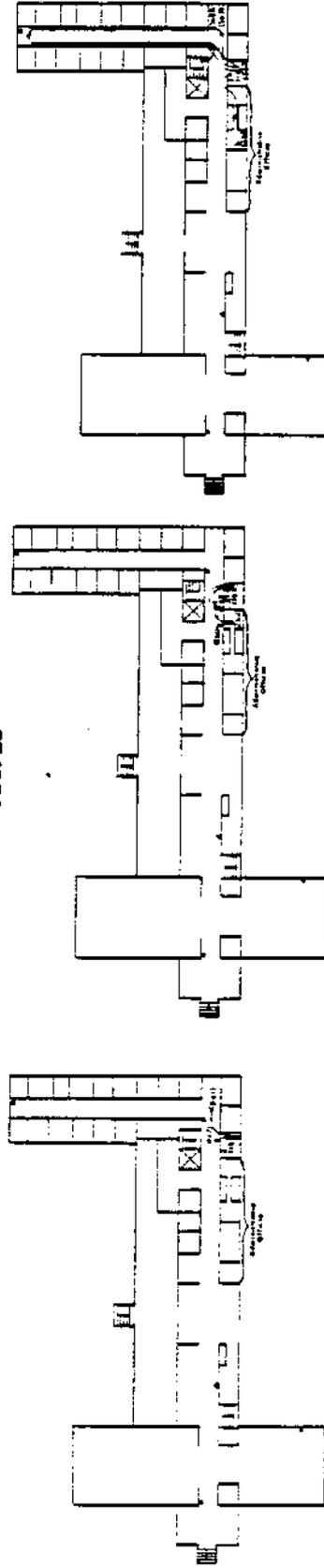
A. Behavioral Episodes.

1. The housekeeper and administrator attempted to locate the source of the smoke to clarify the ambiguous fire cues, and perceive the extent of the fire incident threat.
2. Evacuation was initiated immediately following the confirmation of the fire incident.
3. The lack of facility emergency procedure training of the housekeeper due to her new employment status, did not appear to effect her utilization of effective adaptive behavior.
4. The absence of a majority of the residents in Section A and the ambulatory condition of most of the residents, greatly facilitated the evacuation process.
5. The utilization of two, five pound listed (15) dry chemical extinguishers, rated 2A, 10BC (11) by the assistant administrator to suppress the closet fire appeared to be the result of previous training.
6. The administrator's order to immediately notify the fire department, when alerted to the ambiguous smoke cue appeared to be the result of previous training.

Realms 1, 2 and Episodes 1, 2, 3



PEOPLE



B. Fire and Smoke Realms.

1. The smoke was contained to room 116, the room of origin due to the closed room door.
2. The fire was limited to the closet in room 116, initially by the closet door and through the application of the two, five pound dry chemical extinguishers.
3. The five pound, listed (15) dry chemical extinguishers, rated 2A, 10BC (11) were properly charged and operated as designed.
4. There was no activation of a smoke detector, sprinkler head, (8), or the local alarm system (9) in this fire incident.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses.

(The assistant administrator suppressed the flames in the closet with the application of a five pound, listed (15) dry chemical extinguisher, rated 2A, 10BC (11) and then completed the extinguishment of the smoldering fire with another identical extinguisher.)

1. Personnel appeared to expect control of the fire incident due to their training and their concept of professional competence with fire incidents at the facility.

B. Alternative Behavior Hypotheses.

(The administrator upon opening the closet door and observing the flames ordered the housekeeper to initiate the avacuation of the first floor of the facility.)

1. The selection of behavioral alternatives by staff personnel, appeared to be primarily influenced by the staff training and their knowledge of the facility emergency procedures.

FO. SHEPPARD PRATT HOSPITAL, JUNE 24, 1979

The fire was detected by a security officer during a normal routine patrol at approximately 2016. The security officer observed smoke issuing into the corridor from room 48A, a laundry room, with a closed door. The security officer immediately activated an alarm box on the local alarm system, (9) phoned the facility operator, and then radioed the security office. The fire incident occurred on the ground floor of the "B" building erected approximately 80 years ago of fire resistive construction.

The security officer obtained a five pound dry chemical listed (16) extinguisher, rated 2A, 10BC (11), entered the laundry room, crawled to a trash can which contained the fire and discharged the extinguisher which effectively extinguished the flames. The fire was extinguished prior to the arrival of the facility fire brigade and the Baltimore County Fire Department. The Fire Department verified extinguishment, overhaul, and ventilation of the laundry room area.

No patients were in the fire area, and no patients were evacuated.

CONCLUSIONS

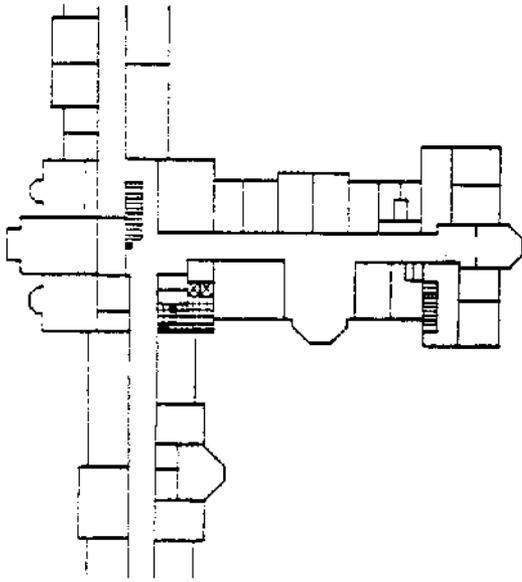
A. Behavioral Episodes

1. The facility emergency procedures were initiated and implemented effectively including: the provision for facility alarm, fire department notification, and manual suppression.
2. The adaptive behavioral actions during this fire incident appeared to be a result of staff training.
3. The staff actions in the use of the 5 pound listed (15) dry chemical extinguisher, rated 2A, 10BC (11) to suppress the fire appeared to be the result of previous training.

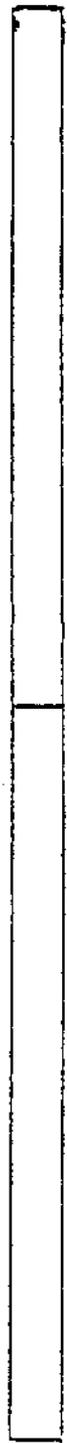
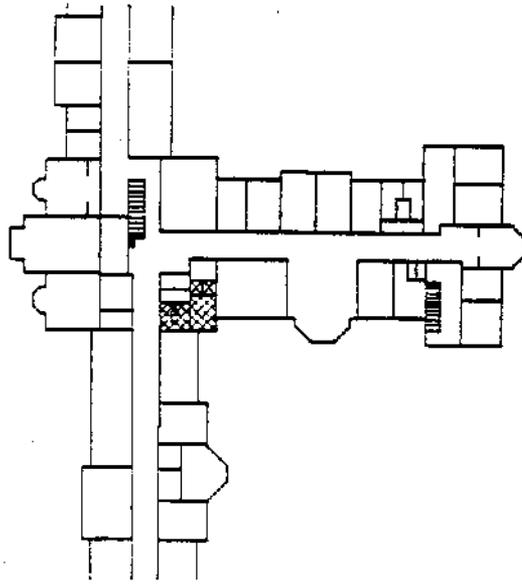
B. Fire and Smoke Realms

1. The majority of the smoke was contained to the room of origin, the laundry room, room 48A, due to the closed room door, thereby maintaining the corridor environment as tenable.
2. The 5 pound listed (15) dry chemical extinguishers, rated 2A, 10BC (11), were properly charged and operated as designed.

Realms 1, 2 and Episodes 1, 2

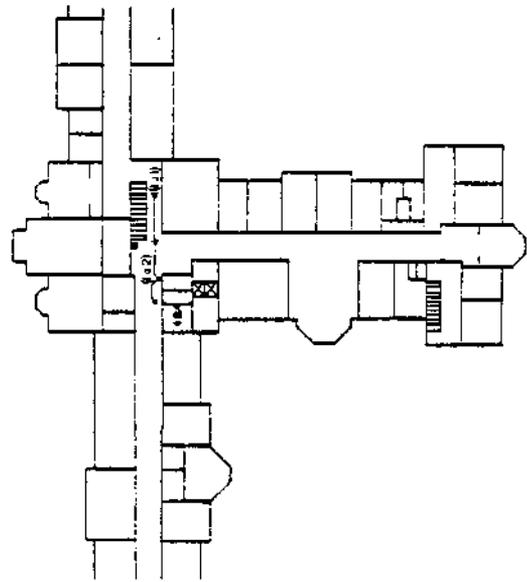


FIRE

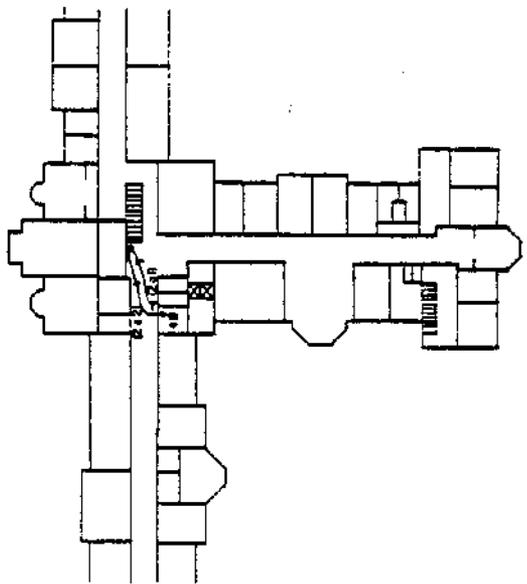


2016

2019



PEOPLE



HYPOTHESES DERIVED FROM THE STUDY

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These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

1. Personnel appear to interpret the verbal fire alarm public address system announcement as a valid emergency announcement due to their previous experience in the facility.
2. Personnel appeared to expect control of the fire incident due to their training, their concept of professional competence and their previous experience with fire incidents at the facility.

B. Alternative Behavior Hypotheses

1. Nursing and staff personnel appear to select behavior which offers the most benefit and protection to the patients from the threat of fire and smoke.
2. The selection of behavioral alternatives by staff personnel, appeared to be primarily influenced by the staff training and their knowledge of the facility emergency procedures.

51. REEDER'S MEMORIAL NURSING HOME, JULY 29, 1979

This fire incident at The Reeder's Memorial Nursing Home on July 29, 1979 was initially detected by the nursing supervisor who perceived a smoke odor in the area adjacent to the dining area on the second floor at approximately 2206. The supervisor investigated and observed smoke in the dining room, which appeared to be centered in the nourishment center. The supervisor immediately closed the smoke barrier doors to isolate the smoke in the dining room area with another staff member. The Supervisor then phoned other staff personnel and the Boonsboro Volunteer Fire Department.

The staff responded to the fire area and evacuated nine patients, from rooms 112, 115, and 117 adjacent to the dining room and nourishment center. The fire department arrived and determined the source of the smoke to be from an overheated electrical cord to an ice machine. Fire department personnel de-energized the ice machine and ventilated the nourishment center with portable fans. There were no injuries in this fire incident and no damage to the two story, three year old, fire resistive building.

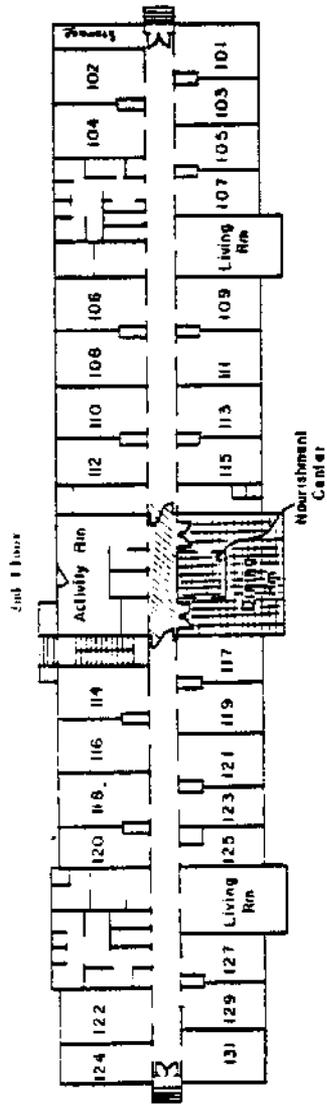
CONCLUSIONS

A. Behavioral Episodes

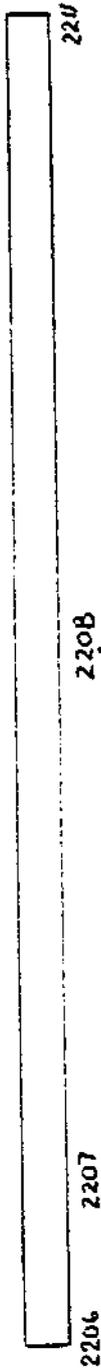
1. The prompt actions of the supervisor and the other staff member in closing room and smoke barrier doors effectively limited the smoke spread to the area of the Nourishment Center on the second floor.
2. The decision not to activate the local alarm system (9) was contrary to the facility fire emergency procedures, and was apparently predicated on the perceived minimum threat of the fire incident.
3. The precautionary and selective evacuation of the nine patients was effectively and efficiently performed.
4. The lack of de-energizing the ice machine allowed the smoke to continue to be produced until the fire department arrived.

B. Fire and Smoke Realms

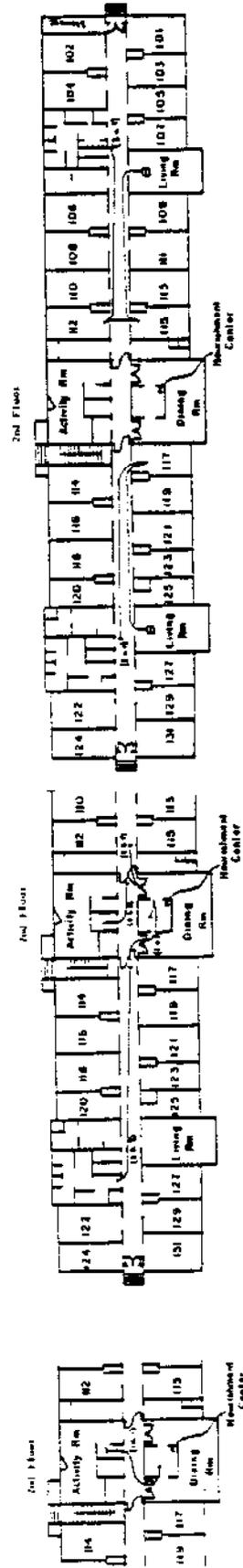
1. The smoke barrier doors effectively contained the smoke to the zone of origin, as designed after being manually closed.



FINE



PEOPLE



Realm 1 and Episodes 1, 2, 3

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study:

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participant's in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

1. Staff personnel appeared to expect the perceived smoke odor to indicate a fire incident occurrence, due to previous training.

B. Alternative Behavior Hypotheses

(The staff evacuated nine residents from adjacent rooms as a precautionary measure.)

1. The precautionary behavior of evacuation following verification of the fire incident appeared to have been determined by the staff concern for the benefit and protection of the residents.

52. UNION HOSPITAL OF CECIL COUNTY, JULY 29, 1979

This fire incident at the Union Hospital of Cecil County on July 29, 1979 was initially detected by a pharmacy technician who perceived a smoke odor in the pharmacy on the first floor at approximately 1212 hours. The pharmacy technician immediately phoned the facility operator who initiated the facility fire emergency procedures with the public address system announcement and notified the fire department.

The pharmacy technician and the laundry supervisor located the source of the smoke emitting from an exhaust duct in the linen finishing room on the first floor. Damage was limited to the duct in the finishing room and light smoke damage to this first floor area in the six story, fire resistive, nine year old building.

Patients were protected in their rooms behind closed doors. The fire self extinguished following the smoke detector activation of dampers in the duct. Ventilation of the first floor area with fans and overhaul procedures was performed by the Elkton, and North East, Maryland Fire Departments with the Christina and Newark, Delaware Volunteer Fire Departments.

CONCLUSIONS

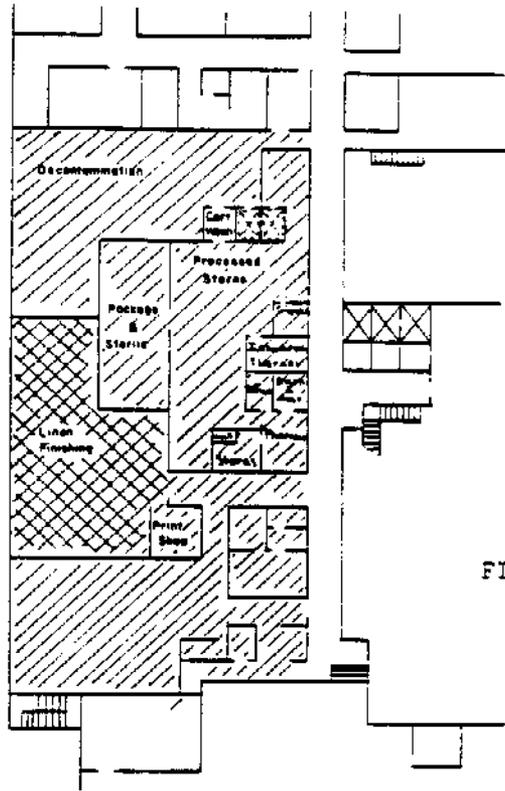
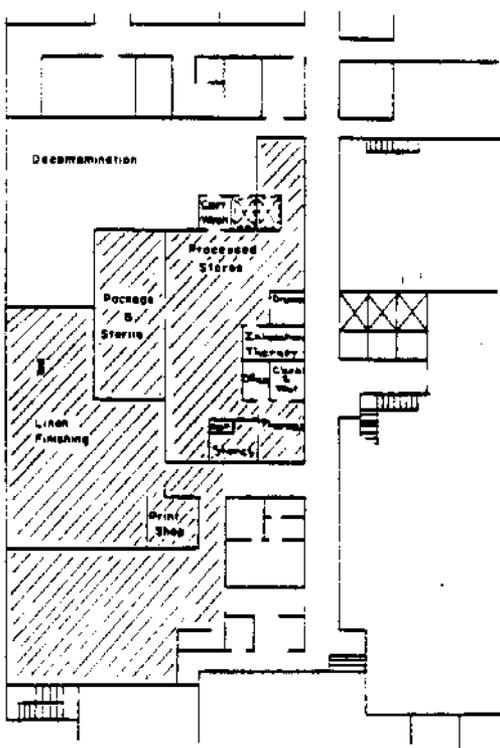
A. Behavioral Episodes

1. The laboratory technician promptly notified the hospital telephone operator of the observation of smoke in the first floor pharmacy in accordance with the facility fire emergency plan.
2. Staff personnel throughout the facility performed the closing of patient room doors in accordance with the hospital's fire emergency plan.

B. Fire and Smoke Realms

1. The duct dampers operated properly as designed upon activation of the duct smoke detectors.
2. The smoke migration was limited to the area of fire origin on the first floor due to the closed duct dampers.

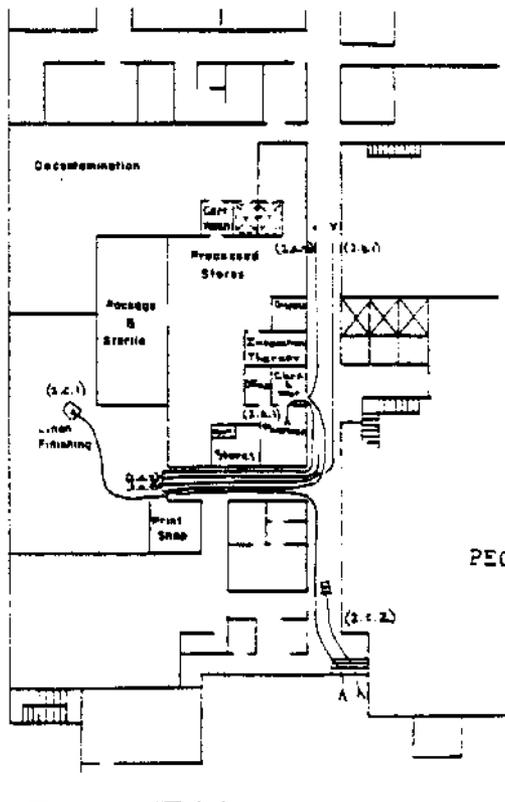
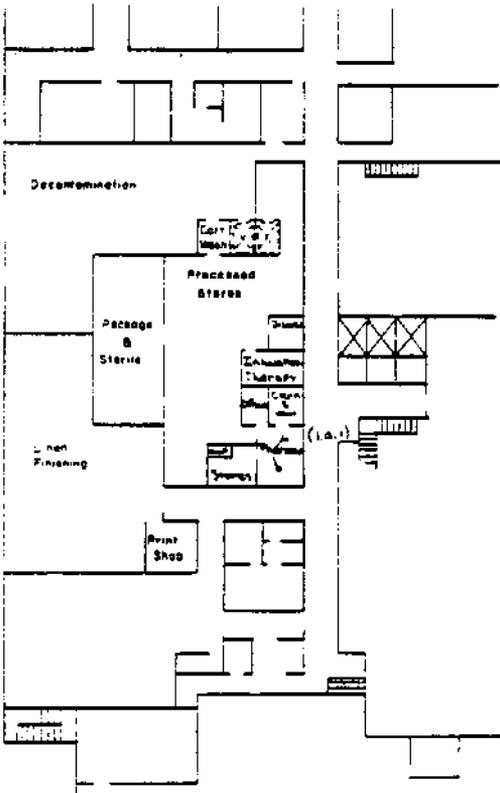
Realms 1, 2 and Episodes 1, 2



1212

1213

1230



PEOPLE

HYPOTHESES DERIVED FROM THE STUDY

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The reported behavioral actions of the participant's in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

(The pharmacy technician initiated the facility fire reporting procedure immediately upon perception of the ambiguous smoke odor cue, reinforced with the visual sighting of the light smoke at the pharmacy ceiling.)

1. Staff personnel appeared to expect the perceived smoke odor to indicate a fire incident occurrence, due to previous training.

B. Alternative Behavior Hypotheses

(The pharmacy technician smells and observes smoke and phones hospital telephone operator.)

1. The alternative behavior of alarm initiation prior to investigation and verification of the fire incident appeared to have been determined by previous training.

53. CROWNSVILLE HOSPITAL CENTER, AUGUST 19, 1979

This fire incident at the Crownsville Hospital Center on August 19, 1979 was initially detected by two patients in ward 02, adjacent to room 8D at approximately 1530. The patients observed smoke issuing from around the closed door to room 8D. The patients immediately phoned the staff at the nurses station on adjacent ward 01, and then evacuated the ward 02 area without assistance.

The nursing staff on ward 01 activated a manual station on the local alarm system (9), and the system failed to operate as it was undergoing repair. The staff also phoned the facility operator who initiated the facility fire emergency plan and phoned the Anne Arundel County Fire Communications Center. The nursing supervisor entered the ward 02 area to confirm the complete evacuation of all patients and was forced to leave the area due to the heavy black smoke. Two facility maintenance personnel attempted to enter the building and the ward through the north exterior door and were prevented by the heavy black smoke.

The Anne Arundel County Fire Department units including the Herald Harbor Volunteer Fire Department responded and personnel with self-contained breathing apparatus extinguished the fire consisting of a polyurethane mattress in room 8D with one 1½ inch hose line. Fire department personnel performed overhaul, salvage and ventilation operations. The heavy black smoke was removed from this 25 year old, partially sprinklered, fire resistive construction building with fans through both doors and windows.

There were no patient injuries in this fire incident and the damage was limited to the bed in room 8D, with smoke damage confined to ward 02 during the eight minutes of this fire incident.

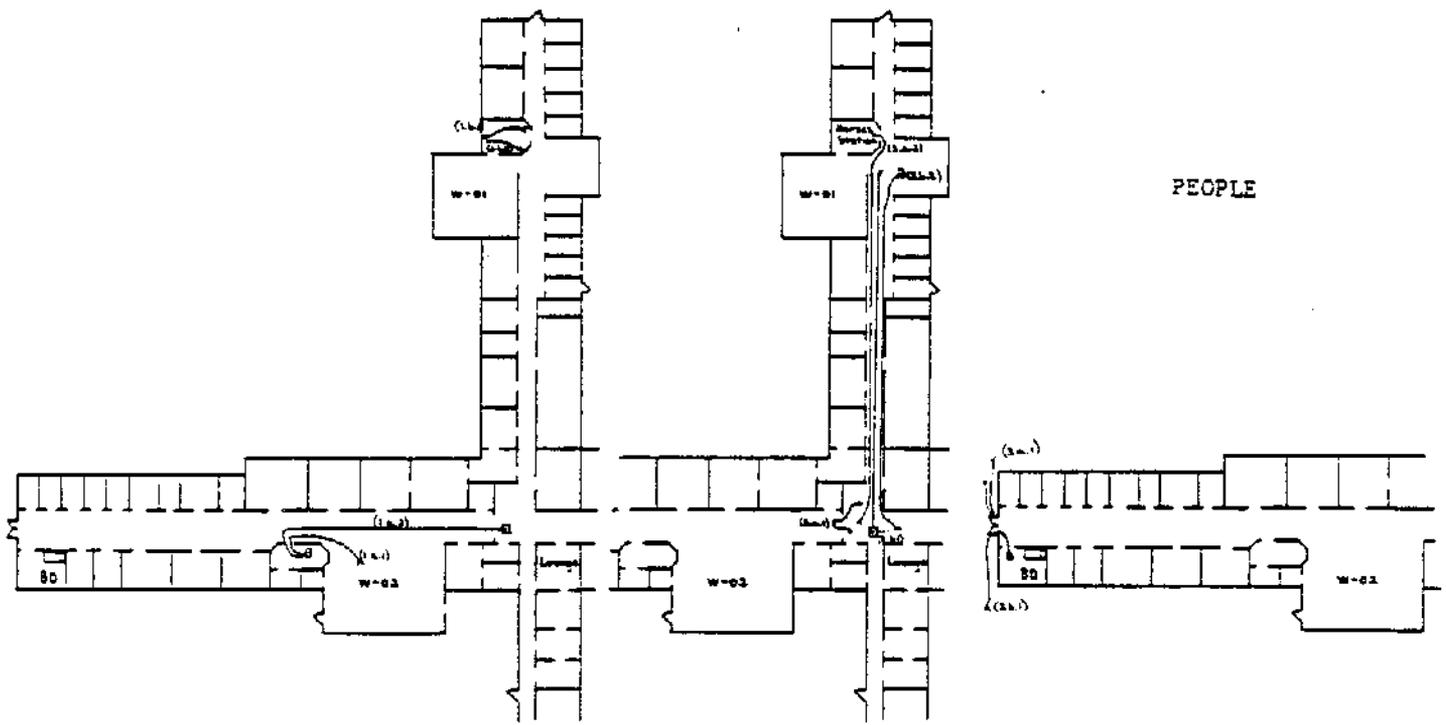
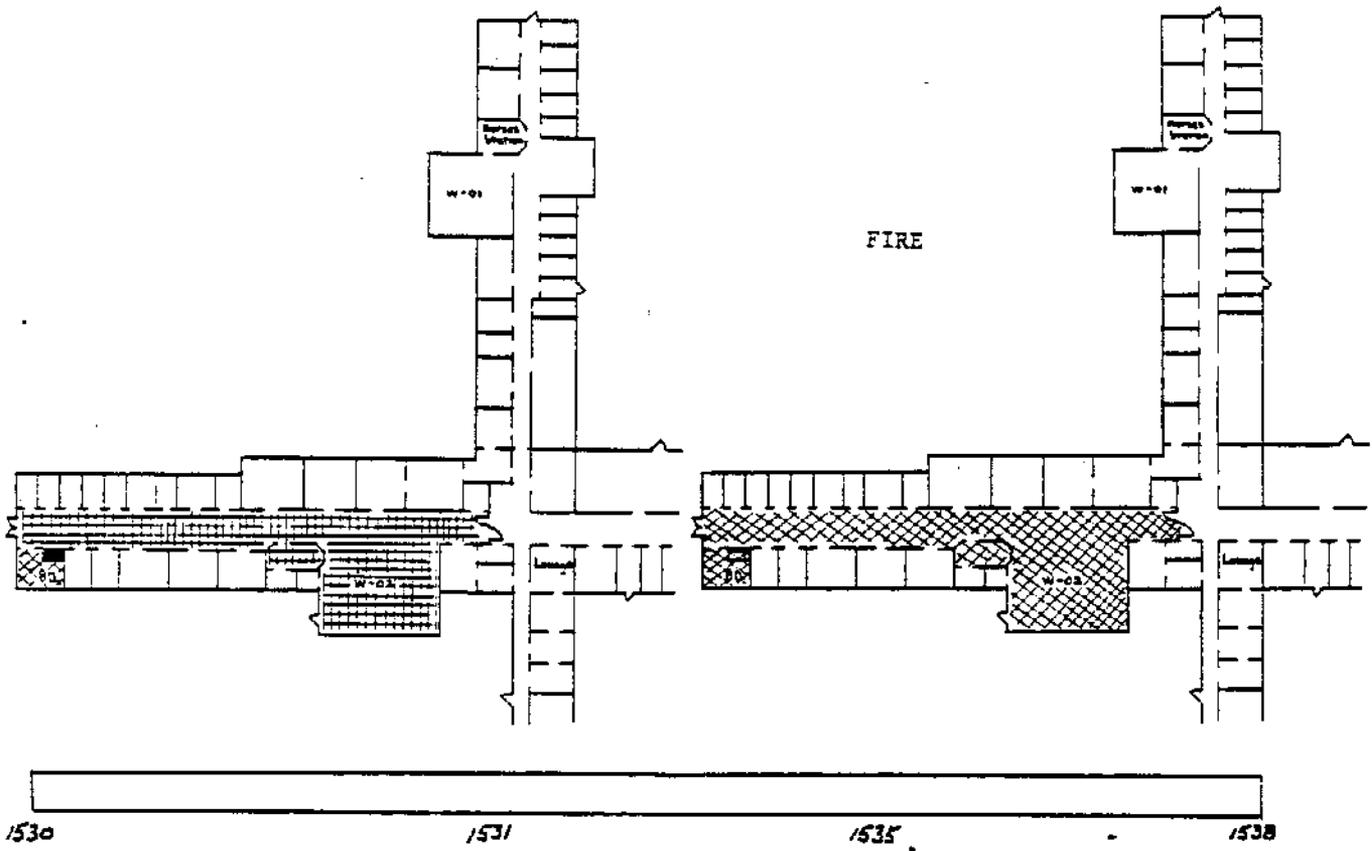
CONCLUSIONS

A. Behavioral Episodes

1. The prompt action to activate the local alarm system (9) and notify the facility telephone operator by nursing staff were in conformance with the facility emergency plan.

2. The nursing supervisor's entering of ward 02 to confirm the complete evacuation of all the patients may be attributed to the supervisor's feeling of concern and responsibility for the welfare of the patients.

Kealms 1, 2 and Episodes 1, 2, 3



3. The immediate self evacuation of the two patients from ward 02 was performed in an emergency response mode, due to the perceived cues of a threatening fire in room 8D.

4. The evacuation of the eight patients from the lounge area to ward 01 was performed as a precautionary measure.

B. Fire and Smoke Realms

1. The local alarm system (9) failed to operate as designed since the system was under repair at the time of the fire incident.

2. The polyurethane composition of the mattress appeared to be a contributing factor for the production of a significant quantity of heavy, black smoke.

3. The closed door to room 8D appears to have been instrumental in allowing for the ward 02 atmosphere to remain tenable to allow the two patients to have time to telephone ward 01 prior to evacuation.

4. The closed smoke barrier door between wards 01 and 02 operated as designed and effectively prevented the propagation of smoke from ward 02.

HYPOTHESES DERIVED FROM THE STUDY

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The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

(The nurse activated the manual station on the local alarm system immediately upon being informed of the fire on ward 02 by the patients, and the system failed to operate.)

1. Nursing staff personnel appeared to expect the local alarm system to be in service and to operate as designed due to their previous training and experience in this building.

(Two facility maintenance personnel with portable extinguishers attempted to enter the north exterior door of the Meyers Building and ward 02.)

2. Staff personnel appeared to expect to be able to enter the area of fire origin and extinguish the fire due to their facility training and previous experience with mattress fires at this facility.

(The maintenance personnel were unable to enter ward 02 due to the heavy black smoke.)

3. Staff personnel appeared to not expect the quantity and type of heavy black smoke created in this fire incident.

B. Alternative Behavior Hypotheses

(The nursing supervisor entered ward 02 to confirm the complete evacuation of the patients and was forced to turn back due to the heavy black smoke.)

1. The evacuation confirmation behavior of the nursing staff appeared to be motivated by a concern and responsibility for the welfare of the patients.

54. MT. WILSON HOSPITAL CENTER, SEPTEMBER 4, 1979

This fire incident at the Mount Wilson Hospital Center on September 4, 1979 was initially detected by a health assistant who observed smoke issuing from room 512, east wing of the main hospital building at approximately 0925 hours. The health assistant immediately called to other staff for assistance. The arriving staff observed the smoke and flaming mattress in room 512, with smoke in the corridors and activated the local alarm system (9) which initiated the hospital fire emergency procedures which include notification of the Baltimore County Fire Department.

Additional hospital staff responded to the area of fire origin, room 512, and suppressed the mattress flames with two, five pound dry chemical listed (15) extinguishers, rated 2A, 10BC (11), following the initial suppression action of water from a trash can. Damage was limited to the room of origin with smoke limited to one of the five smoke zones on the fifth floor of the fire resistive construction building erected approximately twenty-seven years ago.

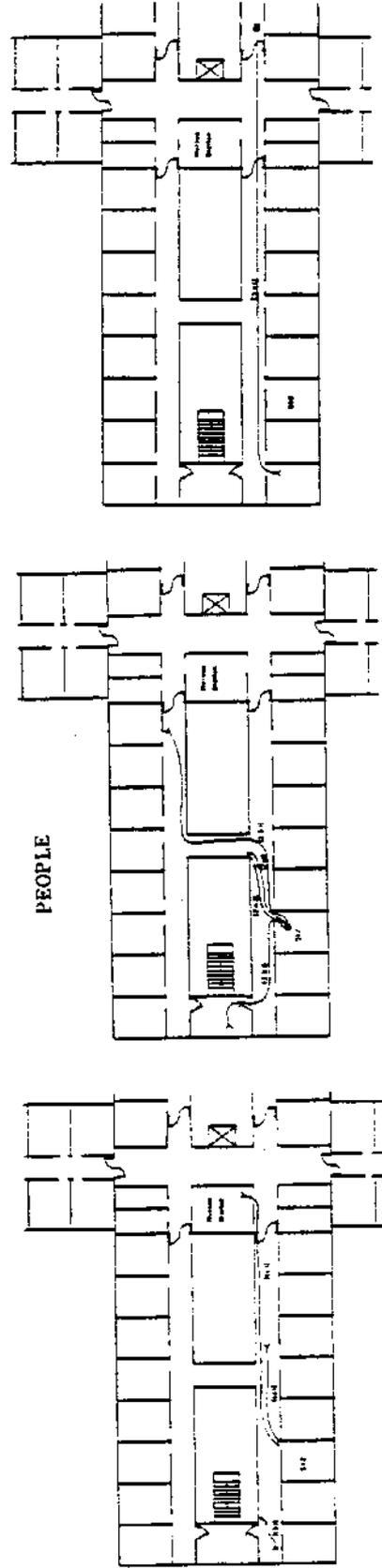
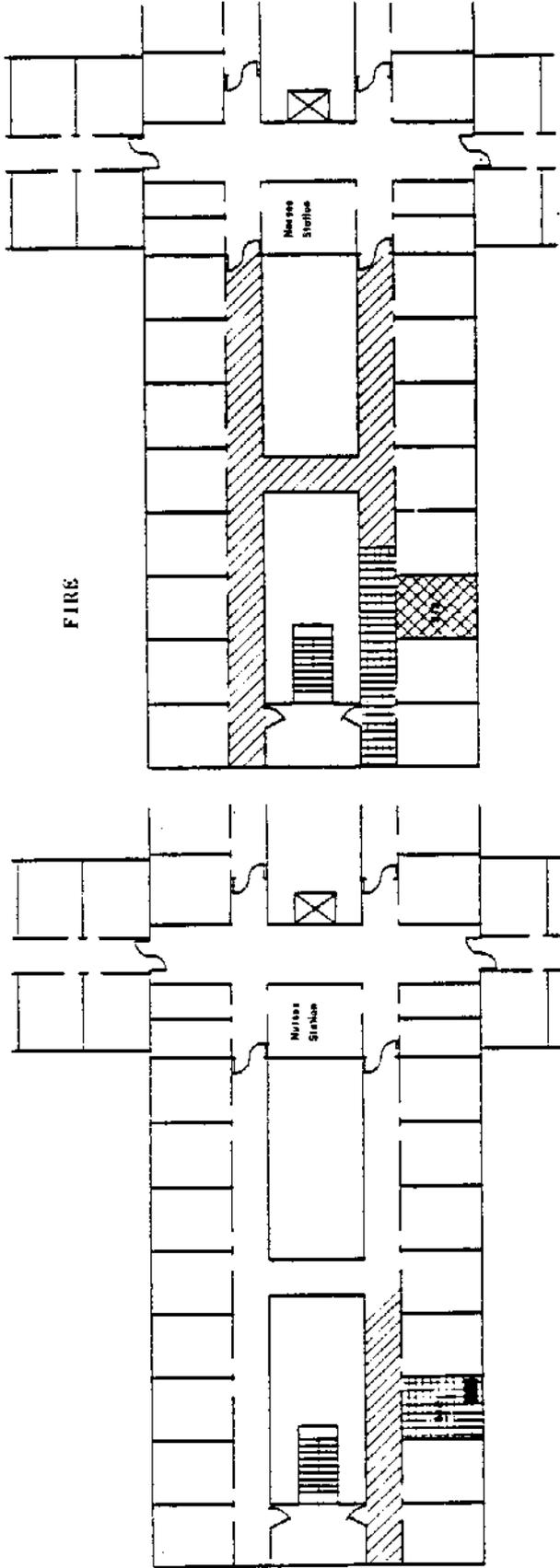
All thirty-two of the patients of the fifth floor, east wing of the main hospital building were evacuated with staff assistance and without injury. The Baltimore County Fire Department responded and verified extinguishment of the mattress fire, and ventilated the fifth floor fire zone with fans placed in opened windows.

CONCLUSIONS

A. Behavioral Episodes

1. The health assistant initiated the emergency procedures immediately after confirming the ambiguous visible smoke cue.
2. Staff personnel investigated to verify and confirm the existence of a threatening fire prior to activation of the local alarm system (9), and initiation of the facility fire emergency procedures.
3. The evacuation of the wing was enhanced by the mobility characteristics of the seven patients.
4. The utilization of the five pound, listed (15) dry chemical, 2A, 10BC rated (11) extinguishers by the staff to achieve suppression of the mattress flames appeared to be the result of previous training.
5. The utilization of the trash can with water by the health assistant appeared to be an example of an adaptive response after her questions on the location of an extinguisher were not comprehended.

Realms 1, 2 and Episodes 1, 2, 3



3. Fire and Smoke Realms

1. The fire was limited to the mattress by the physical separation of the mattress from other combustibles and through the application of the extinguishers and the water.

2. The smoke was able to somewhat spread throughout the fire zone due to the door of room 512 being open initially and by those involved with extinguishment. However, the smoke was essentially limited to room 512 by the closed door for a majority of the duration of the fire incident.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

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The reported behavioral actions of the participant's in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

(The application of the five pound, listed (15) dry chemical, 2A, 10BC rated (11) extinguishers on the mattress fire suppressed the flames.)

1. Staff personnel appeared to expect the application of the dry chemical extinguishers to control the mattress fire due to their previous fire experience at the facility and the extinguisher training with the fire department.

(The health assistant activated the local alarm system immediately upon hearing the bells of "fire".)

2. Staff personnel appeared to expect the calls of "fire" to indicate a fire incident occurrence, due to previous training.

B. Alternative Behavior Hypotheses

(The nursing shift coordinator directed patients to evacuate immediately upon confirming the mattress fire.)

1. The alternative behavior of evacuation following confirmation and verification of the fire incident appeared to have been determined by the staff concern for the benefit and protection of the patients.

55. THOMAS B. FINAN CENTER, SEPTEMBER 9, 1979

This fire incident at the Thomas B. Finan Center on September 9, 1979 was detected by two housekeepers and a direct care aide who were investigating the ambiguous perceptual cue of an abnormal odor. At approximately 1255 hours they observed the mattress, with the resident on the mattress flaming in the seclusion room of cottage 4. The direct care aide went to initiate the alarm and the facility fire emergency procedures, one housekeeper took a blanket, entered the seclusion room and smothered the flames on the mattress and the resident. The other housekeeper gathered the remaining nineteen residents of cottage 4 and evacuated them to the exterior of the building. The evacuation was facilitated by the mobile condition of the patients.

With the extinguishment of the flames, the housekeeper and the direct care aide together moved the smoldering mattress into the pod area, adjacent to the seclusion room, and administered first aid to the resident. The City of Cumberland Fire Department responded, confirmed extinguishment and performed salvage operations. The fire department administered medical aid to the resident who had burns over 34 per cent of the body and transported to the hospital.

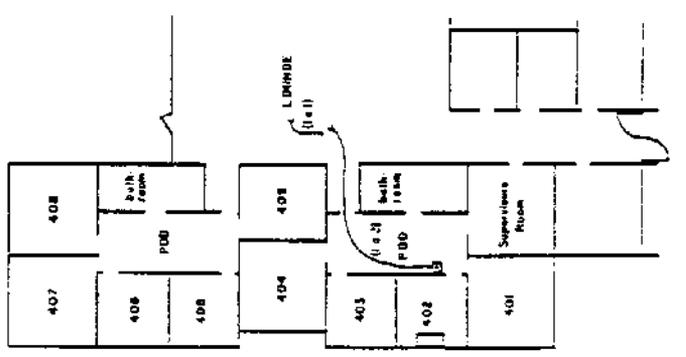
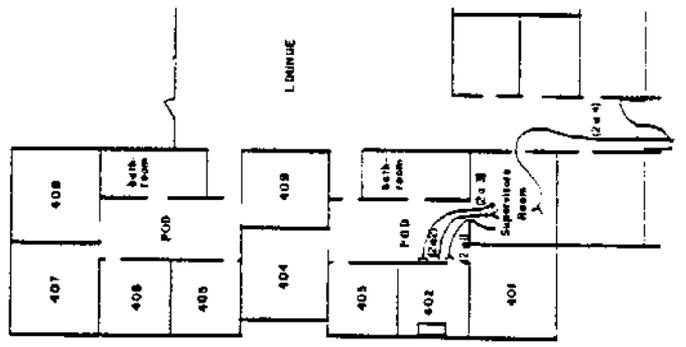
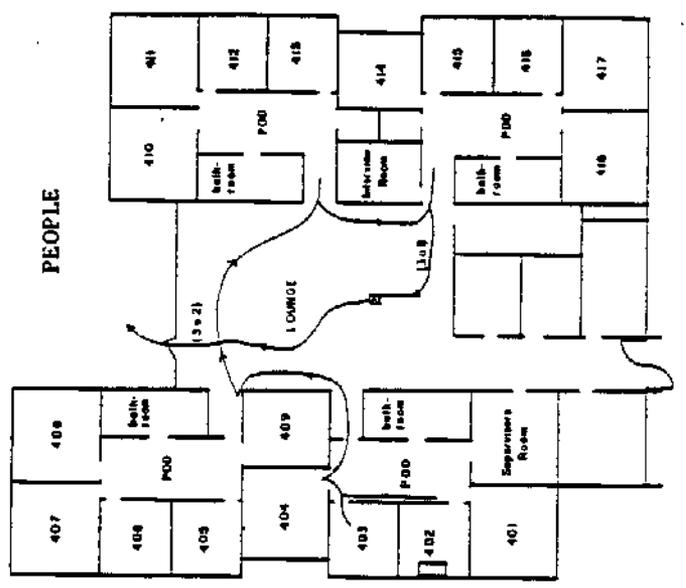
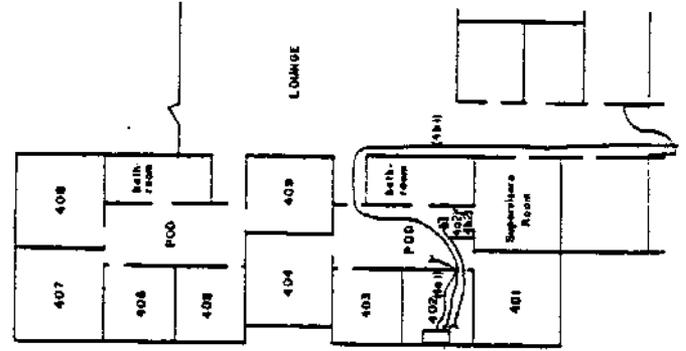
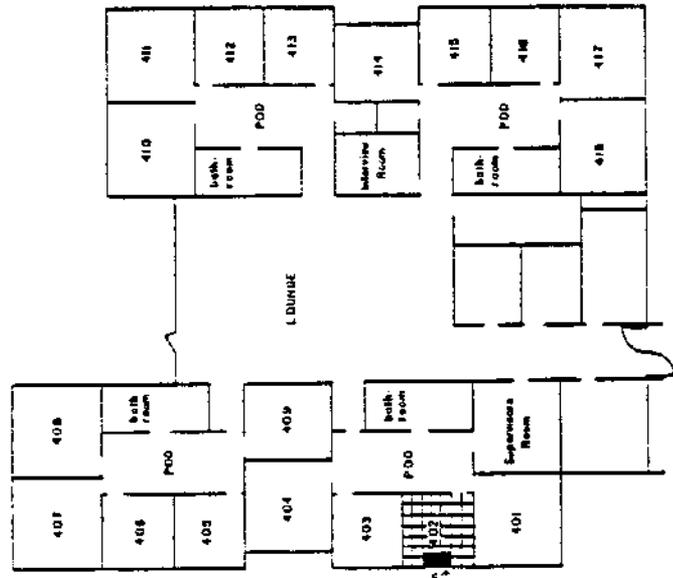
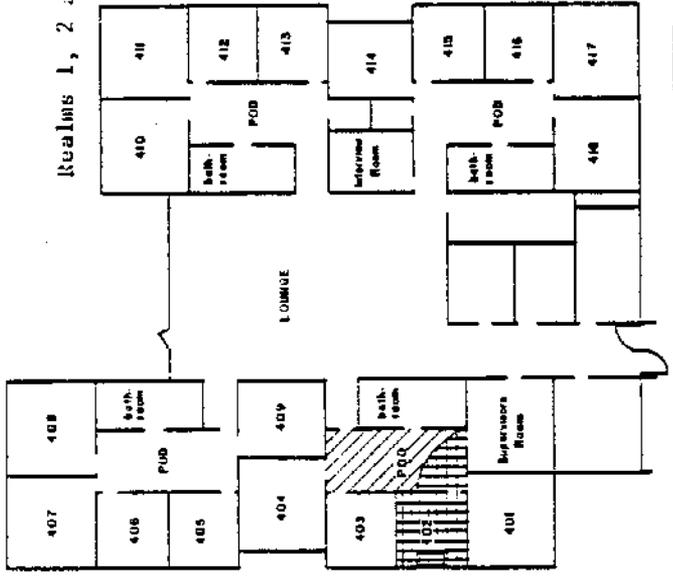
The resident was the only person injured in this fire incident and the smoke damage, to the one year old unprotected noncombustible constructed fully sprinklered building was limited to the seclusion room in the cottage 4 area. There was not enough heat generated to activate the sprinkler head in the seclusion room, although the smoldering mattress did activate a smoke detector in the pod area adjacent to the seclusion room, during the eight minutes of this fire incident.

CONCLUSIONS

A. Behavioral Episodes

1. The facility procedures in initiating the alarm were not followed by the staff detecting this fire incident.
2. The evacuation of the residents was performed efficiently, and was enhanced by the mobility status of the residents.
3. The use of the blanket to extinguish the fire rather than an extinguisher appeared to be due to the immediate availability of the blanket, and the concern to protect the resident.
4. The investigation for the source of smoke was performed due to the ambiguous nature of the perceptual cue, of the abnormal odor.

Realms 1, 2 and Episodes
1, 2, 3, 4



3. Fire and Smoke Realms

1. The local alarm system was activated (9) and operated as designed.
2. The closed door to the seclusion room for much of the temporal sequence of the fire resulted in the maintenance of a tenable atmosphere in the pod area.
3. The smoke barrier doors to cottage 4 operated as designed.
4. A sprinkler head (8) in the seclusion room did not activate, apparently due to the lack of a significant amount of heat in the seclusion room.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

(The housekeepers and the direct care aide investigated the ambiguous perceptual cue of an abnormal odor.)

1. The staff personnel appeared not to expect to discover the mattress fire with the resident involved in the fire, due to their previous experience in this building.

(The housekeeper entered the seclusion room with a blanket and extinguished the flaming mattress and the resident.)

2. Staff personnel appeared to expect to be able to enter the area of fire origin and extinguish the fire due to their facility training.

3. Staff personnel appeared to not expect the involvement of the resident with the life hazard.

B. Alternative Behavior Hypotheses

(The housekeeper entered the seclusion room with a blanket and extinguished the flaming mattress and the resident.)

1. The extinguishment behavior of the housekeeping staff appeared to be motivated by a concern and responsibility for the welfare of the resident involved in this fire incident with the mattress.

56. PENINSULA GENERAL HOSPITAL, SEPTEMBER 22, 1979

This fire incident was apparently initiated with the ignition of the robe and bed clothes of a male patient in the bathroom of room 2102, on the second floor, East wing in the Cardiac Care Unit. The fire was detected by the observation of smoke emitting from under the bathroom door by three visitors in room 2102 at approximately 1650 on September 22, 1979. The visitors opened the door to the bathroom and observed the patient standing with the bath robe in flames. Two of the visitors ran into the corridor calling "Fire", while the third visitor attempted to smother the flames with a blanket.

Staff personnel responded to the calls of "Fire", and initiated the facility emergency procedures by dialing "11" on the facility phone. The facility operator initiated the verbal public address system announcement of "Condition One", and notified the City of Salisbury Fire Department. The Facility Fire Brigade personnel responded with the "Fire Cart". Staff personnel in the area removed the patient from room 2102 by carrying and dragging while the six patients in rooms 2101, 2103, and 2104 were evacuated in wheel chairs. The fire involving the patient and his clothing in the bathroom was extinguished with a listed (14) 4A, 60 BC, rated dry chemical extinguisher, and by smothering with bed linens. The patient was evacuated from the bathroom by a doctor and two visitors and taken to the emergency room for medical treatment.

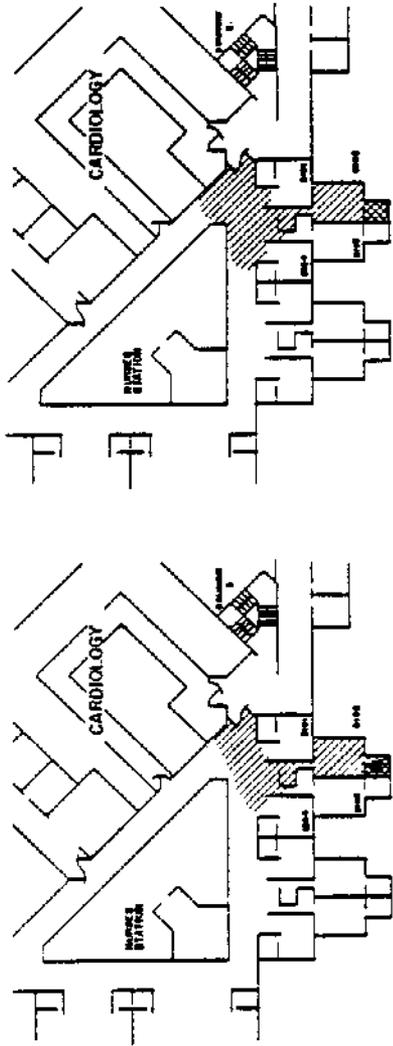
The Fire Brigade and the City of Salisbury Fire Department performed ventilation operations to remove the smoke with fans through opened windows. The smoke was limited to room 2102 and the adjacent corridor area in this five story fire resistive building erected in 1976. The fire damage was confined to the clothing and the male cardiac patient who died on September 24, 1979.

CONCLUSIONS

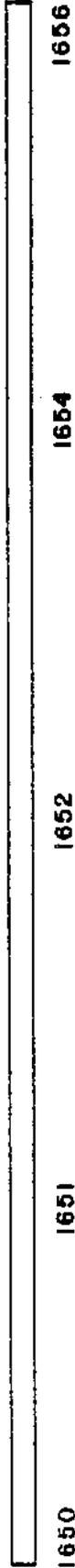
A. Behavioral Episodes

1. Staff personnel investigated to verify and confirm the existence of a threatening fire prior to initiation of the facility fire emergency procedures.
2. The utilization of the listed (14), all purpose, 4A, 60BC rated (11) dry chemical extinguisher by the EKG Technician initiating extinguishment of the fire appeared to be the result of previous training.

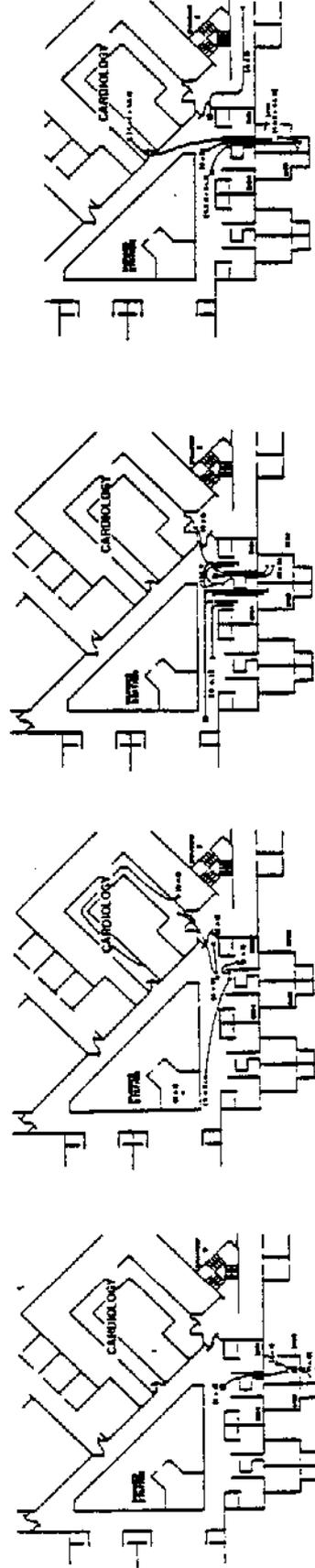
Realms 1, 2 and Episode 1, 2, 3, 4



FIRE



PEOPLE



3. Evacuation of the patient's room mate of room 2102 and use of the dry chemical extinguisher were both performed, prior to the knowledge of the victim's location in the bathroom, and his injured condition because of the greatly obscured visibility due to the intensely irritating smoke.

4. The doctor exhibited an adaptive response upon observing the patient's proximity to the flames by ordering the termination of the use of the dry chemical extinguisher and the use of bed linens to smolder the remaining flames.

5. The Facility Fire Brigade immediately responded to the fire area with its "Fire Cart" in conformance with fire procedures of the internal disaster plan.

6. The prompt and effective evacuation of the adjacent patients rooms may have been a variable of the additional staff in the second floor, East wing at the time of this incident.

7. The actions of the staff appeared to have been conducted in severely irritating smoke conditions, without regard to possible personnel injury, to effect the evacuation of both the patients from room 2102.

8. The actions of the staff in initiation of the facility emergency procedures, in extinguishing the fire and in evacuation of the patients appeared to be the direct result of prior training.

8. Fire and Smoke Realms

1. The fire was limited to the patient's clothing apparently due to the lack of other combustible materials in the bathroom.

2. The listed (14) 4A, 60BC rated (11) dry chemical extinguisher was properly maintained and operated as designed.

3. Ventilation was achieved by the opening of windows in room 2102 and adjacent patient rooms with the use of the fans.

4. No smoke detectors or sprinkler heads were activated in this fire incident.

VIII. HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The special relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic

observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcome of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

(A nurse in room 2101 heard the visitors calls in the corridor and left room 2101 to investigate.)

(A EKG Technician in the corridor near room 2102 also heard the visitor's calls and proceeded to room 2102.)

1. Staff members appeared to have a need to verify and confirm the verbal report from the visitors of the fire incident, possibly due to the nonprofessional staff status of the visitors.

(The EKG Technician returned to the patient room 2102 and immediately attempted to evacuate the victims room mate.)

(The Technician initiated the extinguishment efforts with the all purpose, listed (14) 4A, 60BC rated (11) dry chemical extinguisher until the doctor was able to observe the patient on the floor and advised the technician to stop.)

2. The behavioral actions were initiated without the knowledge or expectation of the patient being involved in the fire in the bathroom.

B. Alternative Behavior Hypotheses

(The technician initiated the extinguishment efforts with the all purpose, listed (14) 4A, 60BC rated (11) dry chemical extinguisher until the doctor was able to observe the patient on the floor and advised the technician to stop. The doctor then asked for linens with which he smothered the remaining small flames.)

1. The doctor appeared to be concerned with minimizing the effect of the dry chemical extinguishing agent on the collapsed patient.

2. Staff personnel appeared to select behavior which offers the most benefit and protection to the patients.

57. CROWNSVILLE HOSPITAL CENTER, OCTOBER 5 AND 12, 1979

Both of the fire incidents at the Crownsville Hospital Center on October 5 and 12, 1979 were initially detected by patients in ward 01. The first incident was detected at approximately 1353, and the second fire incident was detected at approximately 1455. The patients observed smoke issuing from room 3 due to a mattress fire. The patients immediately called to the staff at the nurses station on ward 01. The staff evacuated the ward 01 area without assistance, due to the mobile nature of the twenty-five patients.

The nursing staff on ward 01 activated a manual station on the local alarm system (9), and also phoned the facility operator who initiated the facility fire emergency plan and phoned the Anne Arundel County Fire Communications Center in both fire incidents. Both of these mattress fires were extinguished by nursing staff with a 2½ gallon, listed (15), pressurized water, rated 2A, (11) extinguisher. Staff personnel then removed the smoldering mattress to the exterior of the building.

The Anne Arundel County Fire Department units including the Herald Harbor Volunteer Fire Department responded and personnel confirmed the extinguishment of the mattress. Fire department personnel performed overhaul, salvage and ventilation operations. The smoke was removed from this 25 year old, partially sprinklered, fire resistive construction building with fans through both doors and windows.

There were no patient injuries in either of these fire incidents and the damage was limited to the mattress in both incidents, with smoke damage confined to ward 01 during the seven minutes of the fire incident on October 5, and during the eleven minutes of the fire incident on October 12, 1979.

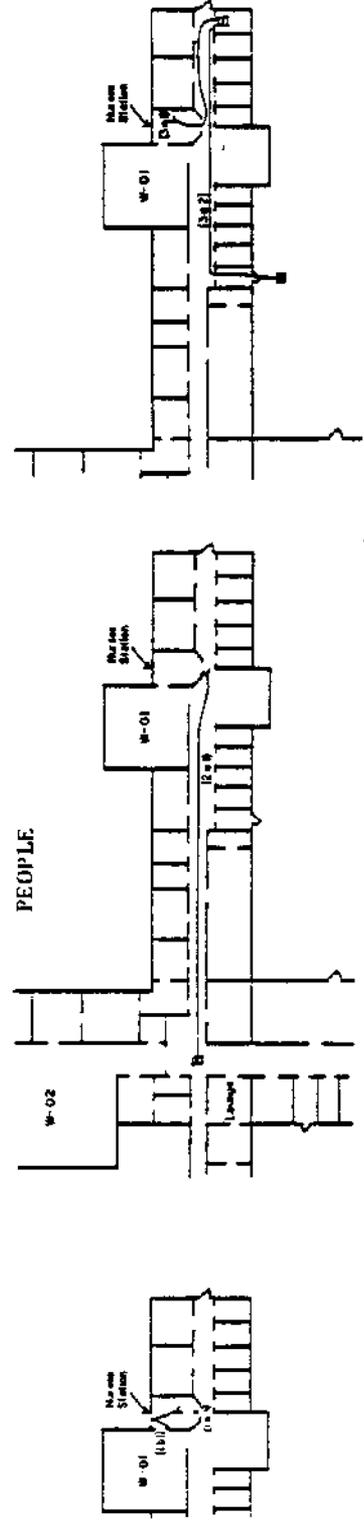
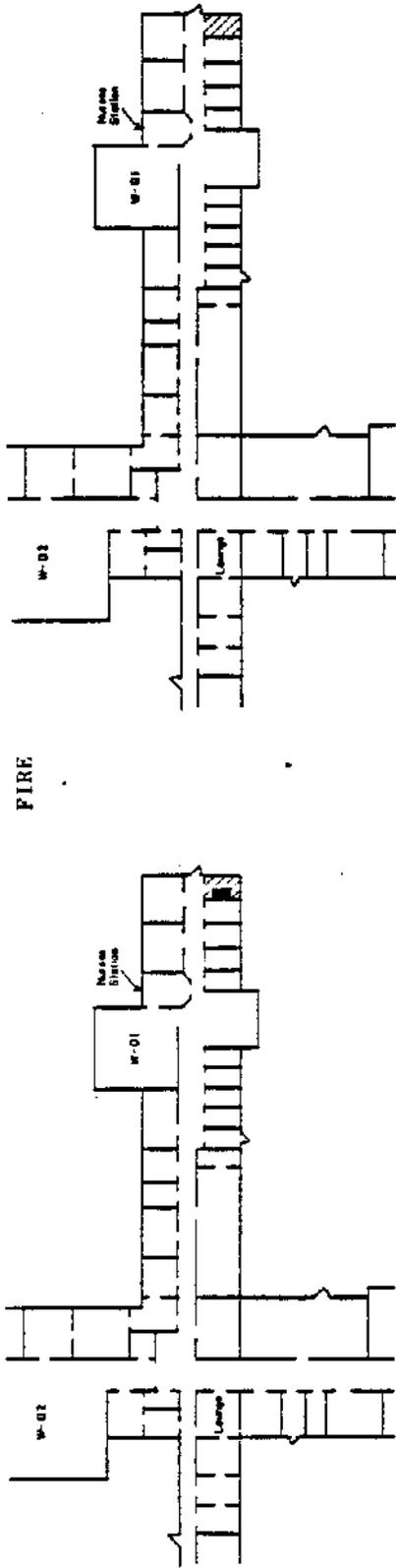
CONCLUSIONS

A. Behavioral Episodes

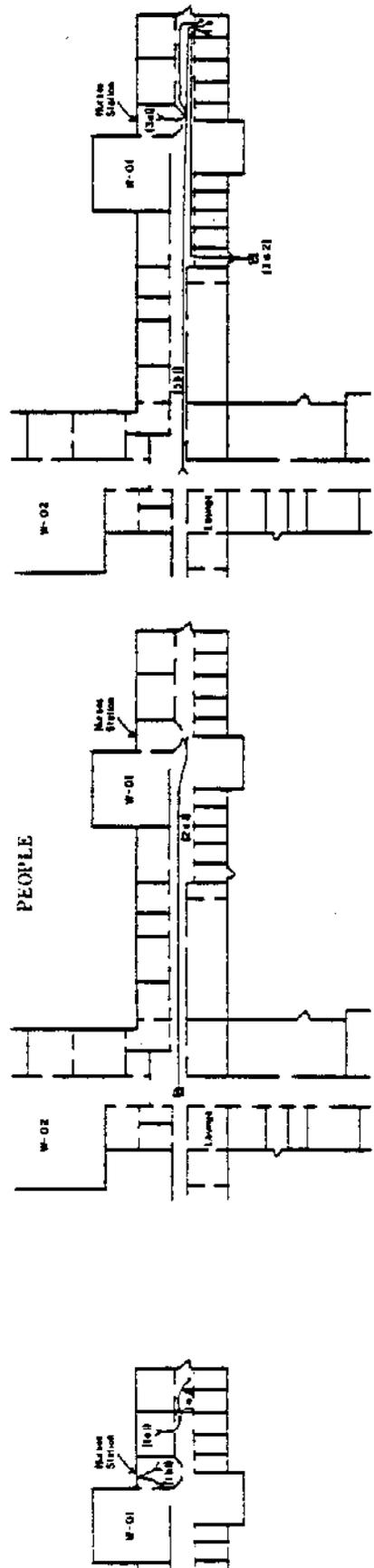
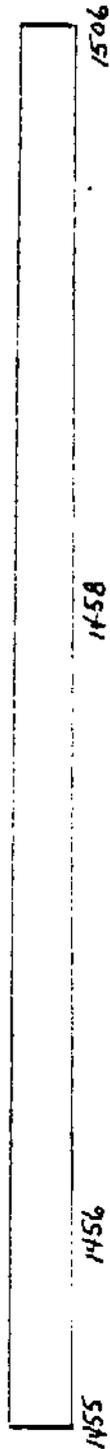
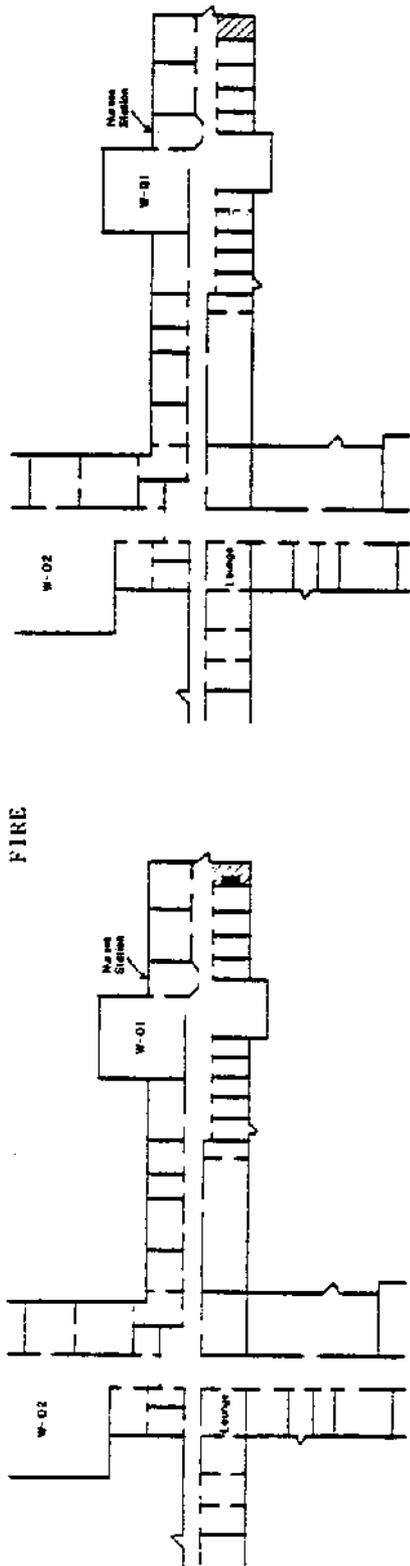
1. Staff members were alerted by residents in both fire incidents. The apparent need to verify the existence of the second fire incident may be attributed to the prior experience of the nurse at this facility, since a fire incident in the same room, twice in seven days is a unique event, and not the expected event.

2. The facility emergency procedures were promptly initiated and followed in both fire incidents.

Reams 1, 2 and Episodes 1, 2, 3. Incident One



Reviews 1, 2 and Episode 1, 2, 3. Incident Two



3. The successful extinguishment of the fire in both incidents by the nursing staff, with a listed (15) 2½ gallon pressurized water, rated 2A (11), extinguisher appeared to be related to their prior training as presented by the fire department.

4. The movement of the smoldering mattress from the cubicle was not learned from training sessions but rather was apparently empirically learned, due to the need to remove the source of the smoke production. It is obvious, the smoldering mattress was not perceived to be a threat to the staff personnel.

B. Fire and Smoke Realms

1. There was no appreciable smoke spread outside of the room of origin in either fire incident which may be attributable to the closed door to the room of origin, room 3.

2. The extinguishers used in the successful extinguishment of the mattress fire in both incidents, consisted of listed (15), 2A rated (11), 2½ gallon pressurized water extinguishers. The extinguishers were properly maintained and operated as designed.

3. The local fire alarm system (9) operated properly as designed.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in these fire incidents.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

(The nurse activated the manual station on the local alarm system immediately upon being informed of the fire on ward 01 by the patients in Incident One.)

(The nurse confirmed the fire existence by observation in Incident Two before activating the local alarm system.)

1. Nursing staff personnel appeared to expect the local alarm system to be in service and to operate as designed due to their previous training and experience in this building.

(Both mattress fires were extinguished by staff personnel with a 2½ gallon pressurized water extinguisher with a 2A rating.)

2. Staff personnel appeared to expect to be able to enter the area of fire origin and extinguish the fire due to their facility training and previous experience with mattress fires at this facility.

B. Alternative Behavior Hypotheses

(A nurse and the Program Supervisor both removed the smoldering mattress from the building following flame extinguishment.)

1. The removal of the smoldering mattress by the nursing staff appeared to be motivated by a concern and responsibility for the welfare of the patients.

58. CROWNSVILLE HOSPITAL CENTER, OCTOBER 12, 1979

This fire incident in the Meyers Building at the Crowsville Hospital Center on October 12, 1979 was initially detected by a resident as an ambiguous abnormal odor. The incident was detected at approximately 1612. The resident perceived the odor in the corridor of the central area of the building, adjacent to the dining area. The resident reported the suspected smoke odor to the staff at the nurses station on ward 04.

The health assistant and the resident investigated the suspected smoke odor in the dining area and detected flames on top of a desk. The health assistant immediately activated the local alarm system, (11) and extinguished the flames with a 2½ gallon, listed (16) pressurized water, rated 2A, (13) extinguisher. The staff then ventilated the area through the exterior doors of the dining area.

The Anne Arundel County Fire Department units including the Herald Harbor Volunteer Fire Department responded and personnel confirmed the extinguishment of the desk top. Fire department personnel performed overhaul, salvage and ventilation operations. The smoke was removed from this 25 year old, partially sprinklered, fire resistive construction building with fans through both doors and windows.

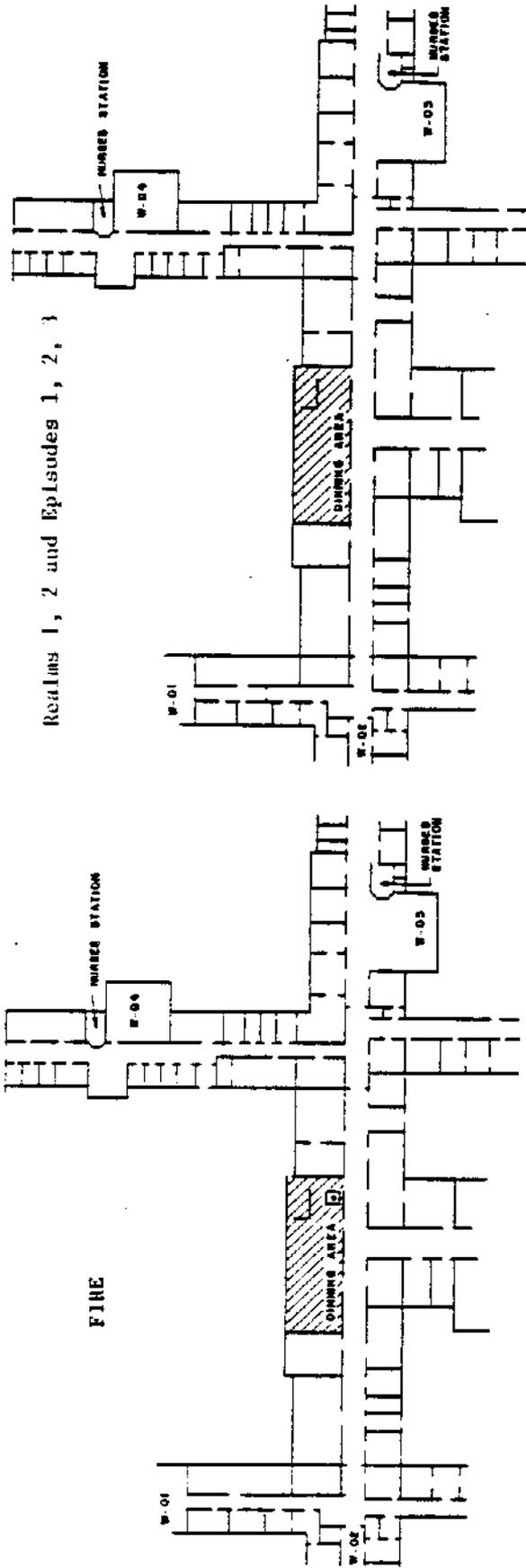
There were no resident or staff injuries in this fire incident and the damage was limited to the top of the desk, with smoke damage confined to the dining area during the five minutes of this fire incident on October 12, 1979. This was the second fire incident in the Meyer's Building on this date with the first fire incident consisting of a mattress fire on ward 01 as previously reported. (2)

CONCLUSIONS

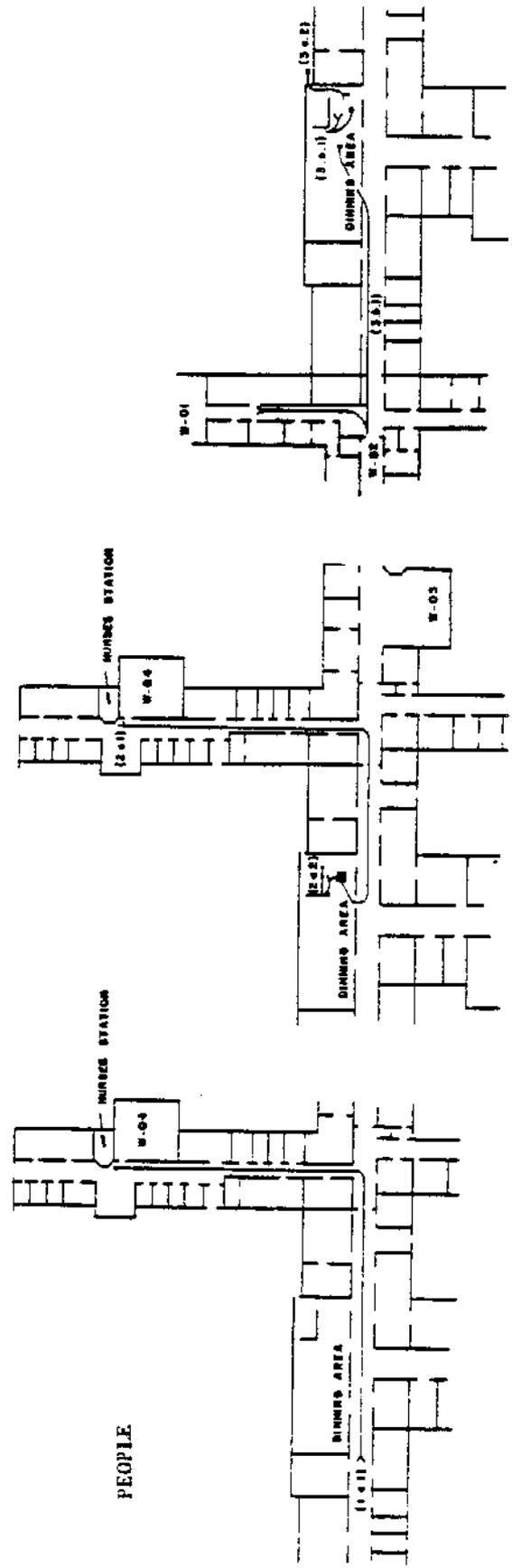
A. Behavioral Episodes

1. The investigation behavior by the staff prior to activation of the local alarm system appeared to be due to the apparent need to identify and verify the reported abnormal odor as a smoke odor and thus confirm the presence of a fire incident.
2. The efficient and effective application of the listed (16) 2A rated (13), 2½ gallon pressurized water extinguisher by the staff appeared due to the previous training of the staff personnel.
3. The decision to protect the patients in their rooms, rather than initiate an evacuation was in conformance with the facility emergency procedures and reinforced by the absence of residents in the fire zone and area of fire origin.

Realms 1, 2 und Episodes 1, 2, 3



FINE



PEOPLE

B. Fire and Smoke Realms

1. The local alarm system (11) operated properly, as designed.
2. The listed (16), 2A rated (13), 2½ gallon pressurized water extinguisher was properly charged and operated as designed.
3. The majority of smoke generated during the fire incident was contained to the dining area by the closed doors to the area, and the staff's ability to ventilate the area by the exterior doors.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in these fire incidents.

These hypotheses are derived from the examination of the following two parameters of this study.

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The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

(Upon observing the flames on the desk top, the health assistant immediately activated the local alarm system.)

1. Nursing staff personnel appeared to expect the local alarm system to be in service and to operate as designed due to their previous training and experience in this building.

(The fire on the desk top was extinguished by staff personnel with a listed 2½ gallon pressurized water extinguisher with a 2A rating.)

2. Staff personnel appeared to expect to be able to enter the area of fire origin and extinguish the fire due to their facility training and previous experience in prior fire incidents at this facility.

B. Alternative Behavior Hypotheses

(The health assistant ventilated the dining area by opening the exterior doors from the dining area following flame extinguishment.)

1. The ventilation of the dining area by the staff appeared to be motivated by a desire to prevent the migration of smoke into the resident occupied areas of the building.

59. GUNSTON SCHOOL, NOVEMBER 30, 1979

This fire incident at the Gunston School on November 30, 1979 was initially detected by a student in room 35 at approximately 2250. The student observed flames emanating from an electric blanket on the floor in the South West corner of the room. The student left the room crossed the corridor and notified the student hall monitor. The student hall monitor returned to the room and verified the fire incident. The student resident of room 35 awoke her room mate, and prior to evacuation the room mate attempted to smother the flames with bedding and being unsuccessful she also suffered 3rd degree burns on both hands.

The student hall monitor notified other students on her way to the second floor to notify the on duty faculty member. She decided not to activate the local alarm system from the manual activation station on the third floor at the North East stairway. The faculty member returned with the student hall monitor to room 35 and upon observing the flames, she immediately ordered the complete evacuation of the building, and she returned to her second floor apartment and phoned the Queen Annes County Fire Board.

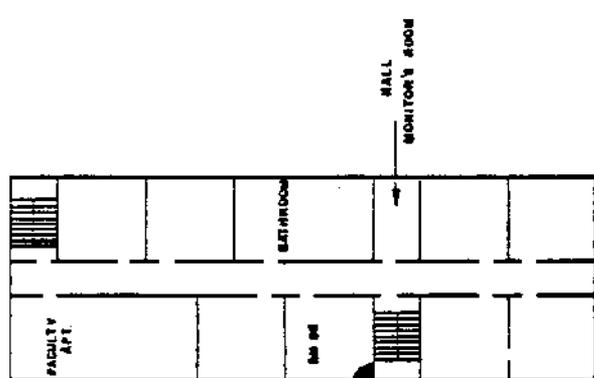
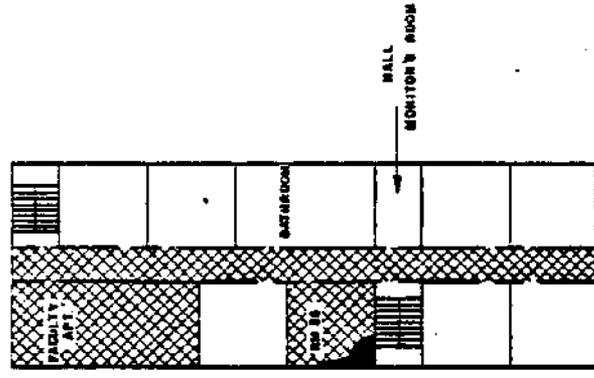
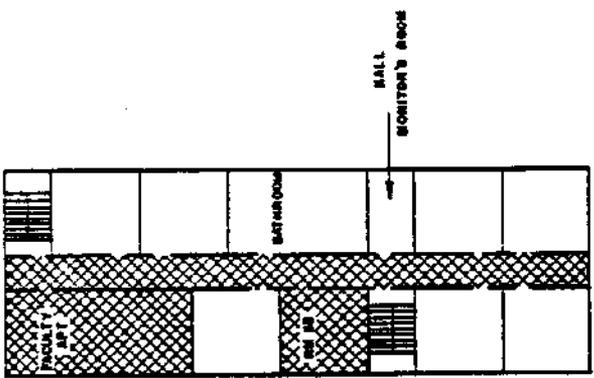
The 30 students evacuated the building in accordance with the pre-practiced evacuation routes. The Centreville Volunteer Fire Department responded and extinguished the fire in room 35 with two 1 and ½ inch hose lines. The heavy smoke in the room of origin and the third floor corridor was ventilated by fire department personnel through opened windows.

The one student suffered minor burns to both hands and the damage was limited to room 35 and the third floor corridor of this 7 year old fire resistive constructed building.

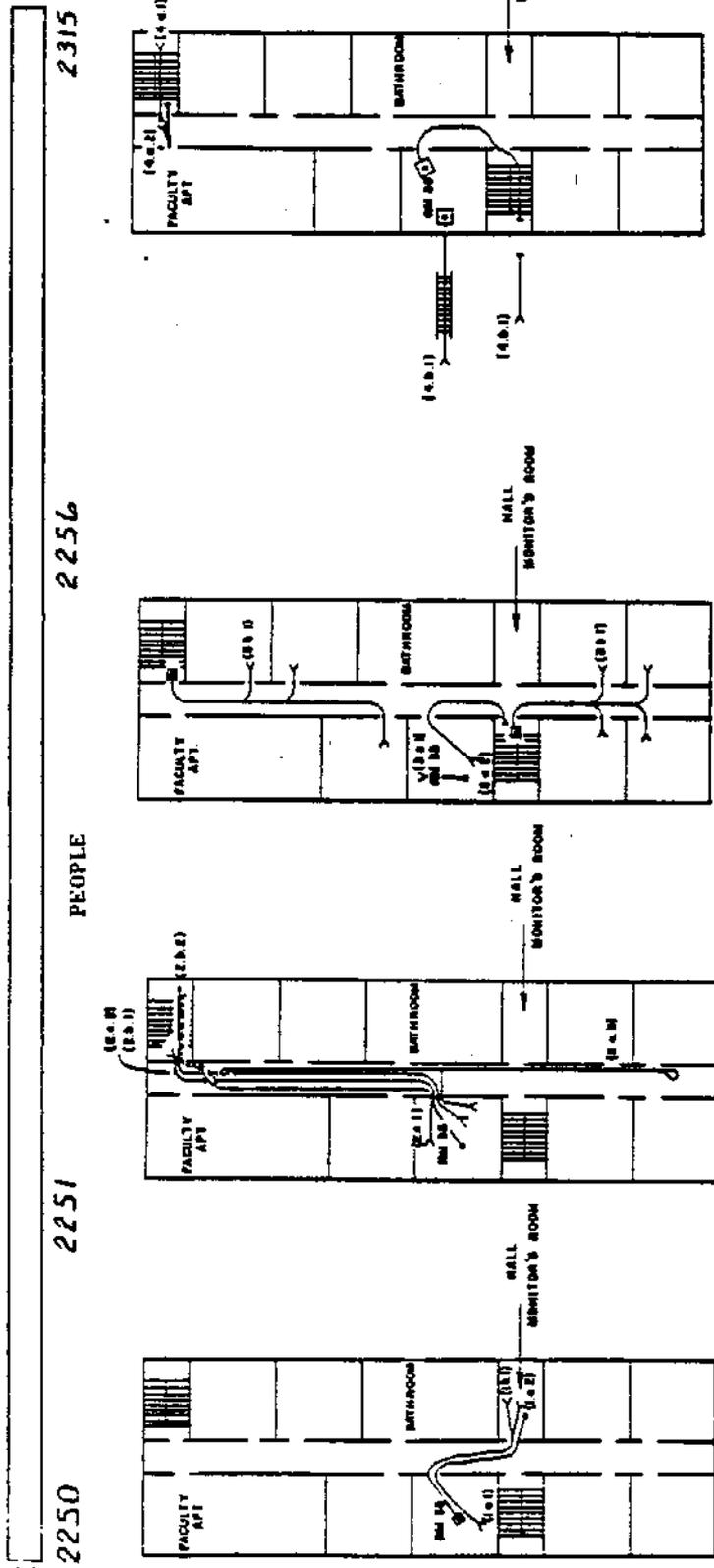
CONCLUSIONS

A. Behavioral Episodes

1. The students initiated the evacuation promptly following verbal notification and instructions without any reinforcing cues such as visible smoke or a smoke odor.
2. The decision not to awaken the sleeping room mate in room 35 appeared to be due to the perception of the fire as posing a negligible threat, and capable of being easily extinguished.
3. The decision of the student hall monitor to not activate the local alarm system (9) also appeared to be due to the perception of the fire as being of minor severity and posing no threat to the student occupants.



FIRE



4. The assistant headmaster's reported attempt to obtain and utilize an extinguisher on the fire was abandoned after observation of the dense smoke in the third floor corridor.

5. The students evacuated the building and the third floor following the previously practiced evacuation routes.

6. The student hall monitor acted in accordance with the facility emergency procedures and effectively directed the evacuation of the third floor.

B. Fire and Smoke Realms

1. The smoke was limited to the room 35 and the third floor corridor by the tight-fitting room doors to the corridor.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The special relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses has been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

(The student detecting the fire left room 35, with her sleeping room mate still in the room and crossed the corridor to notify the student hall monitor.)

1. The students appeared to expect the fire to be easily extinguished and perceived the fire incident as posing a negligible threat.

(The Assistant Headmaster attempted to enter the third floor corridor to obtain an extinguisher to suppress the fire.)

2. The Assistant Headmaster appeared to expect to be able to enter the area of fire origin and extinguish the fire with an extinguisher, due to the accounts of the observation of the fire.

(The Assistant Headmaster was able only to cross the third floor corridor and close the faculty apartment door, due to the heavy smoke.)

3. The Assistant Headmaster appeared to not expect the quantity and type of heavy smoke created in this fire incident.

B. Alternative Behavior Hypotheses

(The faculty member, from the second floor upon observing the flames, ordered the complete evacuation and notified the fire department.)

1. The decision of the faculty member to initiate the complete evacuation of the building and to notify the fire department appeared to be motivated by a concern for the welfare of the students, and to have been directly influenced by the facility training and emergency procedures.

This fire incident was detected simultaneously by staff personnel on the basement level and first floor of A-3 wing, the "A" building at approximately 2108 on the evening of December 10, 1979. The staff member in the basement detected a smoke odor, while the staff member on the first floor not only detected a smoke odor, but also visibly observed light smoke in the corridor adjacent to room 123. One staff member immediately phoned the operator, while the other staff member activated the local alarm system. (9)

The twenty-two ambulatory patients in the A-3 wing were evacuated to the A-1 wing immediately, and the smoke was not a factor in inhibiting the evacuation. The Baltimore County Fire Department was notified by the auxiliary system arrangement (12) and responded. The electrical power to the "A" building was discontinued at approximately 2110, while staff and fire department personnel investigated to find the smoke source.

The source of the smoke was located in an overheated fan coil unit located above the ceiling of the first floor corridor of A-3 wing, and above the ceiling of room 123. There was no appreciable damage and no injuries in this fire incident in the 80 year old fire resistive building.

CONCLUSIONS

A. Behavioral Episodes

1. The facility emergency procedures were initiated and implemented effectively including: the provision for facility alarm, fire department notification, with the protection and evacuation of patients.

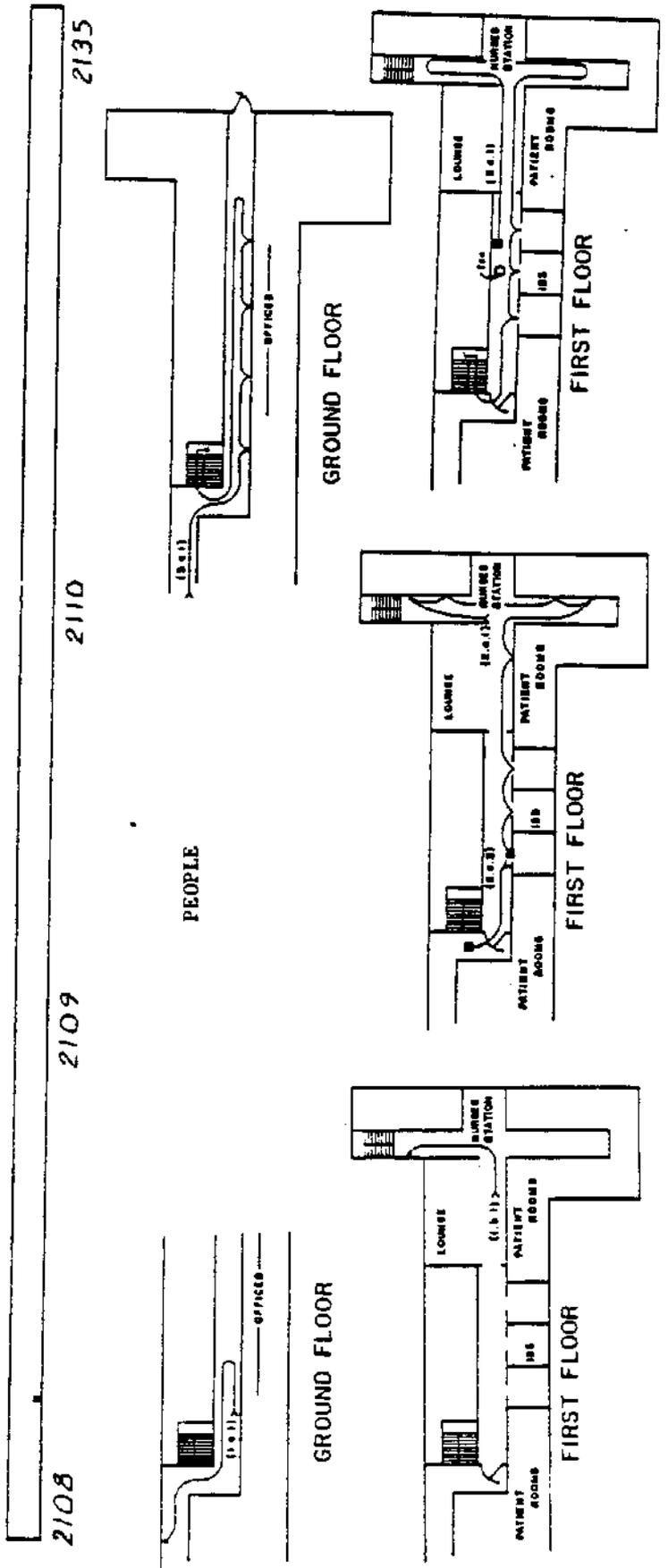
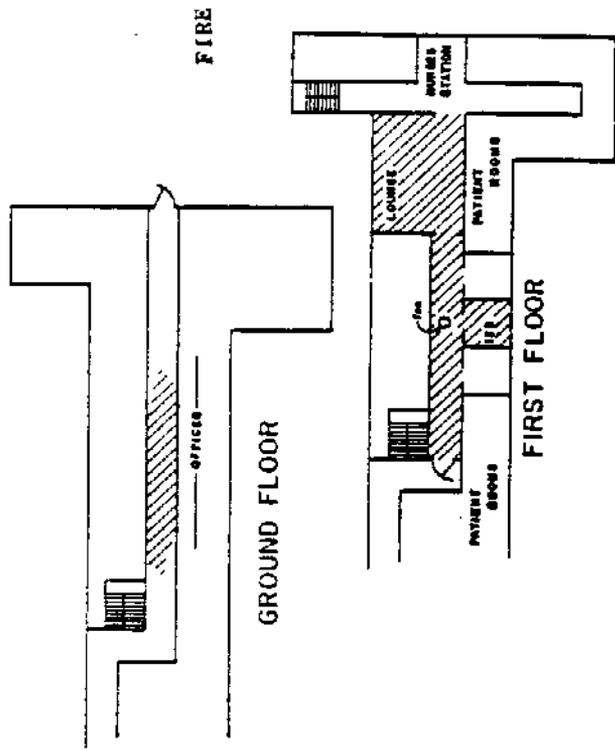
2. The adaptive behavioral actions during this fire incident appeared to be a result of staff training and the professional competence and experience of the nursing staff, security staff, and the facility fire brigade.

3. The ambulatory characteristics of the patients in wing A-3 facilitated their evacuation.

B. Fire and Smoke Realms

1. The local alarm system (9) and the smoke detector in room 123 operated properly, as designed.

2. The smoke propagation to the ground floor was facilitated by the air duct from the affected fan coil unit.



HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The spacial relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

(Many of the patients responded to the local fire alarm system (9) audible signal by lining up, thereby being prepared to evacuate according to the facility emergency procedures.)

1. Both staff and patients appeared to interpret the local fire alarm system (9) audible signal as a valid signal due to their previous experience in the facility.

B. Alternative Behavior Hypotheses

(A nursing staff member on the first floor of "A" building in wing A-3 also noted an odor of smoke and a haze of light smoke in the corridor. The nursing staff member promptly activated the local alarm system (9) with a key.)

1. Nursing and staff personnel appear to select behavior which offers the most benefit and protection to the patients from the threat of fire and smoke.

2. The selection of behavioral alternatives by staff personnel, appeared to be primarily influenced by the staff training and their knowledge of the facility emergency procedures.

61. FALLSTON GENERAL HOSPITAL, JANUARY 27, 1980

This fire incident in the Fallston General Hospital on January 27, 1980 was detected by several patients who observed smoke emitting from under the door of patient room 2036, at approximately 1749. The patients in the psychiatric care ward in the south section, second floor of the service building alerted the staff by their verbal cries. A nursing assistant immediately responded, to room 2036, and upon observing the smoke and feeling heat through the closed room door he immediately returned to the office and phoned the facility operator. The operator initiated the facility emergency procedures and notified the Hartford County Emergency Operations Center.

The ten patients in the psychiatric care ward were evacuated into the adjacent north section geriatric ward on the second floor to the dining and day room. A maintenance man and orderly attacked the fire involving two mattresses on beds in room 2036 with two 2 and $\frac{1}{2}$ gallon pressurized water extinguishers. The personnel were not able to suppress the fire and closed the door to the room and left the psychiatric care ward. The maintenance man immediately returned to the psychiatric care ward and attempted to extend the 1 and $\frac{1}{2}$ inch standpipe hose, but was forced to leave due to the smoke.

The twenty-two geriatric patients were moved to the dining and day room on the geriatric ward. Upon the arrival of the fire department, all thirty-two of the patients were evacuated from the second floor to the first floor cafeteria. The fire department personnel extinguished the fire in patient room 2036 with the 1 and $\frac{1}{2}$ inch standpipe hose, and ventilated the psychiatric care ward area through the opened window in room 2036 and a broken window in the stairway.

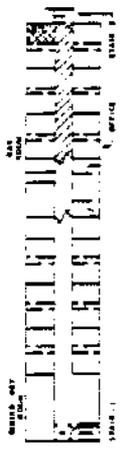
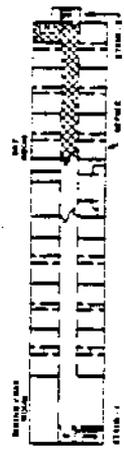
Fire damage in this two story fire resistive building constructed in 1974 was limited to the room of origin, patient room 2036.

CONCLUSIONS

A. Behavioral Episodes

1. The facility emergency procedures were initiated and implemented effectively including: the provision for facility alarm, fire department notification, and the protection and evacuation of patients.

2. The adaptive behavioral actions during this fire incident appeared to be a result of staff training and the professional competence and experience of the nursing and maintenance staff.



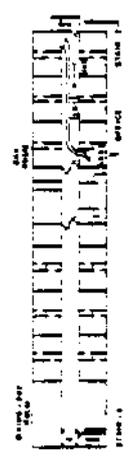
2nd FLOOR

FIRE



1749 1751 1754 1756 1758 1810

PEOPLE



2nd FLOOR



3. The ambulatory characteristics of the ten patients in the fire zone facilitated their evacuation, whereas the limited mobility of the 22 geriatric patients encumbered their evacuation.

4. The adaptive action of the nursing assistant in keeping the door to room 2036 closed upon feeling the heat, retarded the spread of smoke and facilitated the patient evacuation.

5. The utilization of the pressurized water listed (15), 2A rated (11) extinguisher by the staff to attempt suppression of the mattress flames appeared to be the result of previous training.

6. The staged evacuation procedures conducted by staff appeared to be the result of facility training.

B. Fire and Smoke Realms

1. The fire was limited to the mattresses by the physical separation of these materials from other combustibles, and the fire retardant cover.

2. The smoke spread was limited to patient room 2036 until the room door was opened in the extinguishment efforts.

3. The security door in the corridor near the psychiatric care ward day room substantially contained the smoke to the fire zone.

4. The two pressurized water, listed (15), 2A rated (11) 2 & ½ gallon extinguishers were properly charged and operated as designed.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident Study report has been developed from a varied number of systematic observation. Participants in the fire incident have related their behavioral experience as they recalled the experience. The special relationship and geometric configuration with the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral actions.

The reported behavioral actions of the participant's in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

(The orderly and the maintenance man entered room 2036 and discharged the two, 2 & 1/2 gallon, listed (15) pressurized water, 2A rated (11) extinguishers on the flaming mattresses with little apparent effect.)

1. Staff personnel appeared to expect the fire to be controlled or extinguished with the application of extinguishers from their training.

(The maintenance man immediately re-entered the psychiatric care ward and attempted to stretch the 1 and 1/2 inch standpipe hose, but was forced to leave by the smoke.)

2. Staff personnel appeared to not expect the density or intensity of smoke generation.

B. Alternative Behavior Hypotheses

(The nursing assistant decides not to open the door to room 2036 upon observing the smoke and feeling the heat on the corridor side of the door.)

1. The alternative behavior of initiating the alarm instead of continued investigation by opening the door appeared to be the result of facility training and procedure.

(The geriatric patients were evacuated from the second floor dining and day room to the first floor cafeteria in a staged process, involving both carrying and wheel chairs.)

2. The evacuation of the geriatric patients followed the practiced emergency procedures of the facility and appeared to be designed to minimize the patients exposure to possible fire incident effects.

62. CHESAPEAKE HALL DORMITORY, FEBRUARY 3, 1980

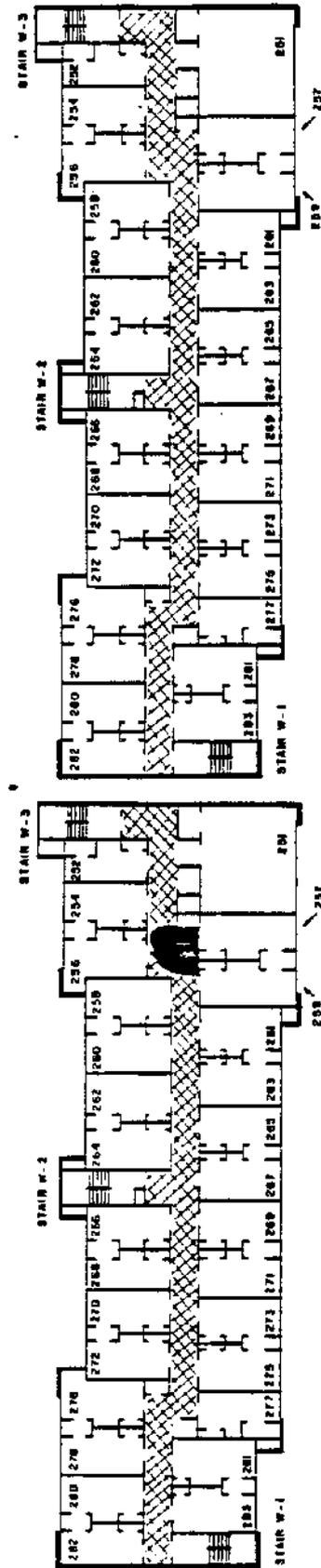
This fire incident occurred on the second floor, north wing of Chesapeake Hall, University of Maryland at Baltimore County in Catonsville, Maryland. The fire incident was simultaneously detected by the resident assistant on the second floor by smoke in her room, the activation of a smoke detector in resident room 257, and the activation of a trouble alarm in the resident director's apartment on the first floor at approximately 0359. The resident assistant opened her room door and observed heavy smoke and flames in the corridor on the north wing adjacent to room door 257. She returned to her room, 266 and dialed the public safety dispatcher on 3133 to have him notify the Baltimore County Fire Department in accordance with the facility emergency procedures. The resident director on the first floor, investigating the trouble alarm heard screams from the second floor and investigated and upon seeing smoke activated the local alarm system (10) at the station on the first floor. The Baltimore County Fire Department received the alarm at 0403.

The Baltimore County Fire Department arrived at 0409 with a box alarm assignment of 4 engines, 2 trucks, and 2 chiefs and various rescue units. Upon arrival the building had been evacuated by the approximately 200 residents. The fire in the second floor, north wing corridor was extinguished by fire department personnel with breathing apparatus and a 1½ inch fire department hose line from the building standpipe system. (13)

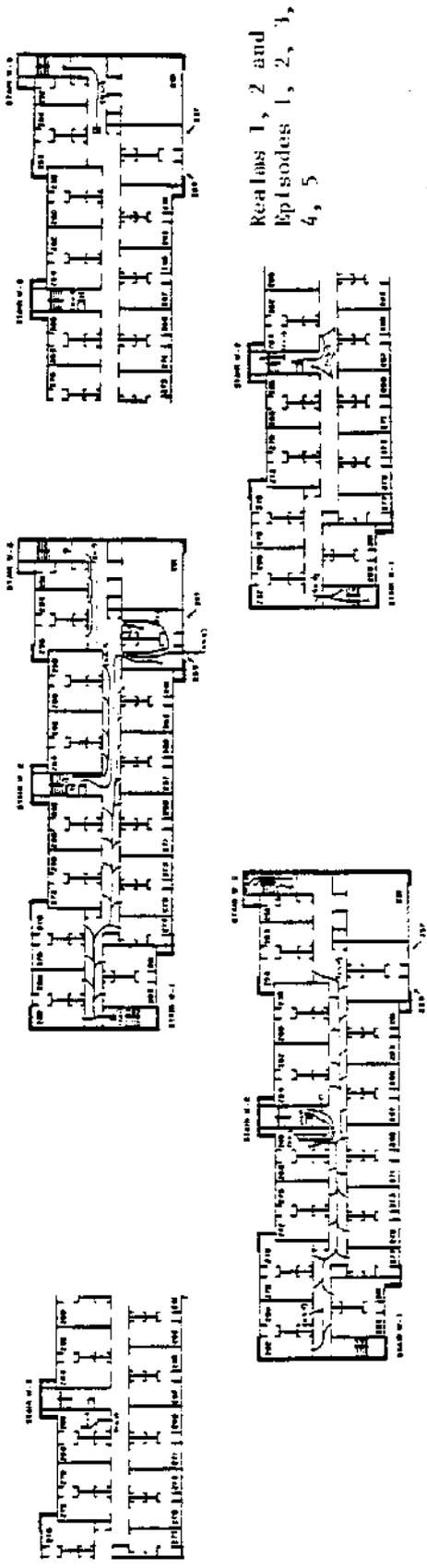
The fire was confined to an area of approximately 80 square feet in the corridor with the smoke propagation confined to the second and third floors of the north wing. The three story and basement, fire resistive building erected approximately ten years ago suffered little damage beyond smoke staining.

Two residents were injured: the second floor, north wing resident assistant was treated at the scene for smoke inhalation suffered in alerting the residents. One female resident was treated at St. Agnes Hospital for injuries received from jumping from a second floor window.

FIRE



PEOPLE



Realms 1, 2 and
Apt. Sodes 1, 2, 3,
4, 5

CONCLUSIONS

A. Behavioral Episodes

1. The resident director on the first floor, and the resident assistant on the north wing of the second floor both attempted to structure the ambiguous fire cues before alerting others.
2. The occupants appeared to initiate evacuation immediately upon observing flames, smoke or a smoke odor. Evacuation appeared to be inhibited when these fire cue observations were absent.
3. Approximately twenty-one occupants traversed through smoke in their successful evacuation behavior.
4. One resident of room 257 jumped from the window of room 259, after two unsuccessful evacuation attempts through the corridor.
5. The other four residents from rooms 256, 257 and 259 initially unsuccessful in evacuation due to the smoke and flames, were able to evacuate through the second floor, north wing corridor on their second or third attempt.
6. The actions of the resident assistants in facilitating the evacuation of the residents from their rooms was in accordance with the general fire safety plan of the University of Maryland, Baltimore County Campus.
7. The behavior of the resident assistant on the second floor, north wing in moving through the smoke filled corridor twice, alerting residents appeared altruistic and most adaptive.

B. Fire and Smoke Realms

1. The trash located in the corridor, which was the apparent area of fire origin, was not placed in the trash room since it was completely filled with trash. Such heavy accumulation of trash is attributable to the residents moving into the dormitory on the previous day for the spring semester.
2. The local alarm system (10) and standpipe system (13) operated properly as designed.
3. The three stairways were permeated with smoke above the second floor due to the stairway doors being propped open by residents during their moving procedures.
4. The fire was limited to the area of trash fuel apparently due to the non-combustible and fire retardant nature of the interior finish materials.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The special relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

(The resident director was awakened by a trouble alarm and went to the annunciator panel in the first floor lobby when he heard screams.)

1. The resident director appeared to expect to find the alarm system malfunctioning when screams were heard.

(The evacuation of residents was inhibited in the south wing where the cues of the fire incident could not be perceived.)

2. The residents appeared to expect the sounding of the local alarm system (10) to be a false alarm due to their previous experience in this dormitory building.

(One female resident broke the window of room 259 and jumped twenty feet to the ground, after the unsuccessful corridor evacuation attempts.)

3. The resident appeared to perceive entrapment due to the previous evacuation attempts and to not expect injury from the jump to the ground.

3. Alternative Behavior Hypotheses

(The resident assistant, from the second floor north wing, upon observing the heavy smoke and flames, returned to her room and phoned Public Safety to notify the fire department.)

1. The decision of the resident assistant to notify the fire department appeared to be motivated by a concern for the welfare of the residents, and to have been directly influenced by the facility emergency procedures.

(The resident assistant obtained a towel, dampened it with water and made two trips up and down the second floor, north wing corridor, knocking on the room doors and calling to residents to evacuate.)

2. The decision to alert the residents and reinforce the activation of the local alarm system by the resident assistant, which involved movement through heavy smoke and resulting personal injury appeared to be motivated by a concern for the welfare of the residents.

63. WASHINGTON ADVENTIST HOSPITAL, MARCH 5, 1980

This fire incident at the Washington Adventist Hospital on March 5, 1980 was initially automatically detected by the activation of a 165 degree F. sprinkler head on the wet pipe sprinkler system (7) at approximately 0933 hours, which activated the local alarm system.(8) In accordance with the facility emergency procedures the hospital operator initiated the verbal "Doctor Red" announcement on the public address system and notified the Montgomery County Emergency Operations Center on the direct private phone line. Due to the initiation of a disaster simulation exercise at 0930 hours, the local alarm system (8) activation for the fire was perceived to be related to the exercise.

However, the hospital security staff and the Takoma Park Volunteer Fire Department responded to the X-ray area. The X-ray area is located on the first basement floor of the four story and two basement fire resistive building which is approximately seven years old. The fire department was at the hospital due to the disaster simulation exercise, and upon verification of a sprinkler activation radioed a for a complete alarm assignment.

Staff personnel in the X-ray area detected the fire in the Records Storage Room closet by the water on the floor with the smoke in the area, and utilized one 4A, 10BC rated (10) and listed (15) dry chemical extinguisher.

Due to the fire resistive construction of the building, the location of the room of fire origin on the first basement level, and the immediate extinguishment action by the automatic sprinkler system precluded the need for patient evacuation. The fire department performed salvage operations and restored the wet pipe sprinkler system to service.

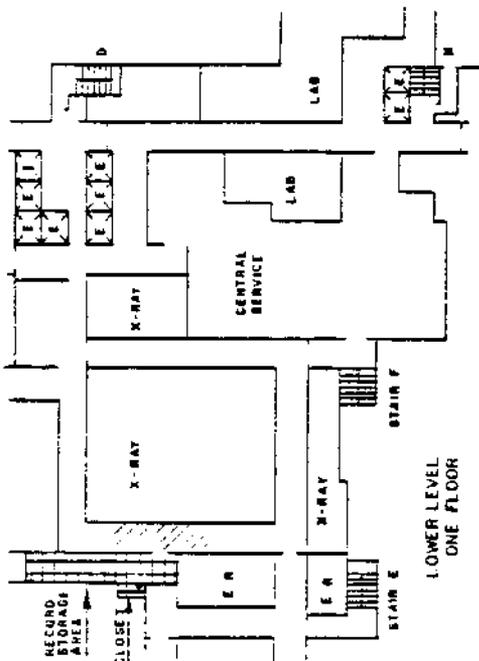
CONCLUSIONS

A. Behavioral Episodes

1. The X-ray student attempted to locate the source of the water to structure this ambiguous cue, and thus detected the fire incident subsequent to the automatic detection.

2. The activation of the local alarm system (8) for the fire incident was not responded to by staff in the area due to the awareness of the disaster simulation exercise and the association of the alarm with that exercise.

3. The hospital operator followed the emergency procedure by calling the fire department, and initiating the "Doctor Red" announcement with the fire location over the public address system.



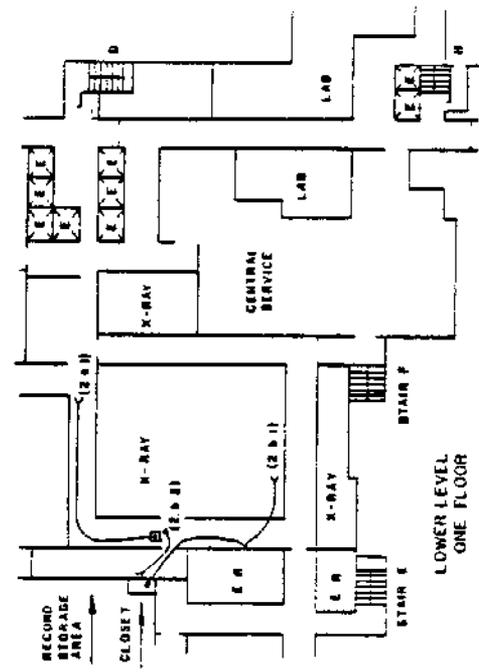
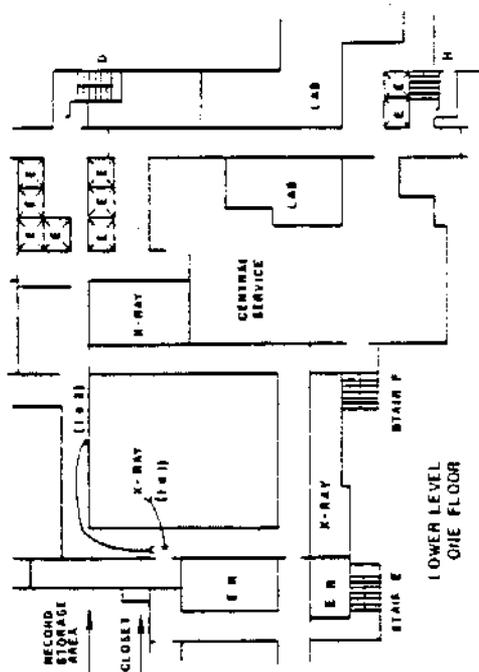
FIRE

0933

0936

0938

PEOPLE



4. The unfamiliarity with the facility emergency procedures, and the observed operation of the wet pipe sprinkler system (7) by the student apparently resulted in the perception of a minor threat occurrence and the seeking of assistance.

5. The utilization of the listed (14), rated (10) 4A, 30BC Dry Chemical extinguisher by the X-ray technician to insure extinguishment appeared to be the result of previous training.

B. Fire and Smoke Realms

1. The fire was contained to the contents of the box by the operation of the wet pipe automatic sprinkler system. (7)

2. The smoke was able to propagate freely from the closet to the records storage room due to the absence of a closet door.

3. The listed (14) dry chemical extinguisher, rated 4A, 30BC (10) was properly charged and operated as designed.

4. The wet pipe automatic sprinkler system (7) and the local alarm system (8) both operated as designed.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationship existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The special relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure have been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcome of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

(The student nurse returned to the X-ray examination area and called for the chief X-ray Technician.)

1. Having observed smoke, flame, and the operation of the sprinkler system, the staff member appeared to need verification of the fire incident, possibly due to the student status of the staff member.

(The staff in the fire zone did not apparently respond to the local alarm system (3) or the "Doctor Red" announcement due to the disaster simulation exercise being conducted.)

2. The X-ray staff expected the alarm signal and announcements to be concerned with the simulation exercise and did not expect a fire incident.

B. Alternative Behavior Hypotheses

(The technician conducted extinguishment efforts with the dry chemical listed (14) 4A, 30BC, rated (10) extinguisher even though the fire appeared to have been extinguished by the wet pipe sprinkler system. (7))

1. The technician appeared to be concerned with assuring the extinguishment of the fire.

54. PATUXENT INSTITUTE DIAGNOSTIC CENTER, MARCH 5, 1980

This fire incident in the Diagnostic Center Building at the Patuxent Institute on March 5, 1980 was initially detected by a correctional officer in the guard station of the visitor's room in the basement at approximately 1020. The officer directed a visitor to leave and notified the building control center. Three correctional officers responded with two converted pressurized water 2 & 1/2 gallon extinguishers. The extinguishers were not able to produce an effective stream of water. The control center was notified to initiate the facility emergency procedures and three additional correctional officers responded with two dry chemical 2A, 10BC (11) extinguishers and one 15 pound CO₂, Listed (14) extinguisher. These extinguishers were discharged on the flames with marginal effects.

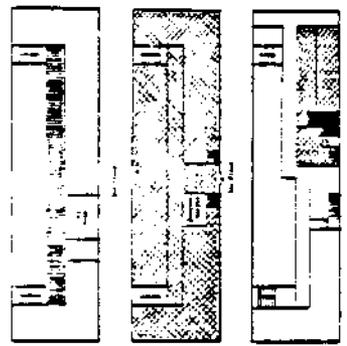
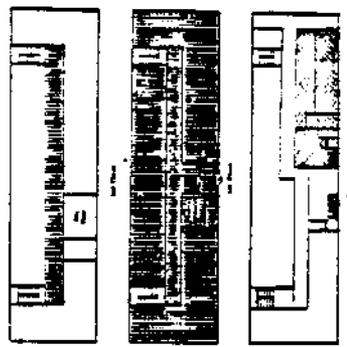
The correctional captain notified the control center to phone the Howard County Fire Department. The correctional officers evacuated from the visitors room and initiated the evacuation of approximately fifty staff personnel from the first floor. These personnel were moved through smoke during the evacuation.

The fire department extinguished the fire in the basement visitors room with one 1 and 1/2 inch hose line and one 2 inch hose line after a delayed interior attack due to the building security features. A second alarm response was initiated as a precautionary measure. Fire department personnel assisted correctional officers in the evacuation of the seventeen inmates from the hospital area on the second floor of the protected non-combustible constructed building.

CONCLUSIONS

A. Behavioral Episodes

1. The delay in initiating the facility emergency procedures and the fire department was apparently due to a perception the fire could be controlled with the available personnel and extinguishers.
2. The evacuation of staff personnel was delayed due to an apparent initial perception of the fire as being incipient and nonthreatening.
3. The evacuation of the inmates in the hospital was delayed due to their remoteness from the fire effects, the ventilation reducing the smoke exposure and the security requirements for their evacuation.



FIRE



1020

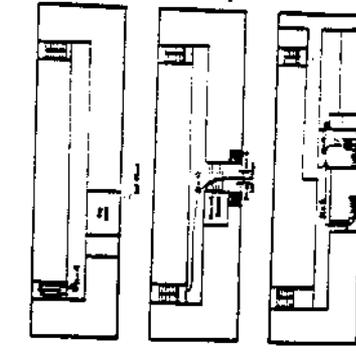
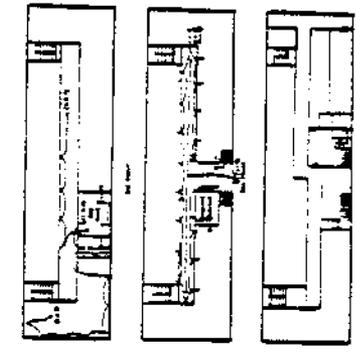
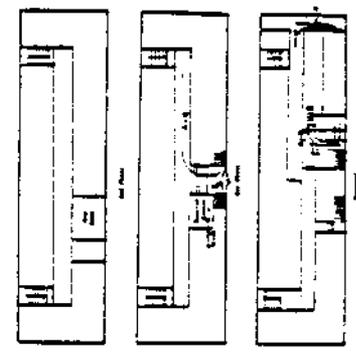
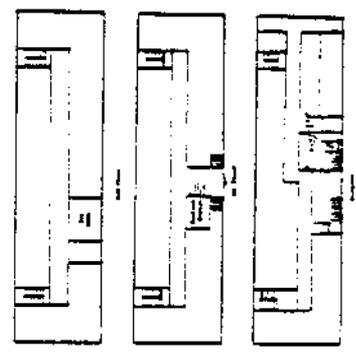
1021

1029

1036

1027

PEOPLE



Realms 1, 2,
3 and
Episodes 1,
2, 3, 4

4. The ambulatory characteristics of the inmates and staff facilitated their evacuation.

5. The decision of the commanding fire department officer to request a second alarm and evacuate the inmates in the hospital is attributed to the experienced access problems and unknown propagation of the fire.

B. Fire and Smoke Realms

1. The converted pressurized water extinguishers apparently did not operate properly.

2. The Listed (14) dry chemical, and CO₂ extinguishers operated properly, as designed.

3. The unenclosed vertical stairways from the basement to the first floor allowed the smoke to readily propagate to the first floor. Propagation of the smoke to the second floor is attributed to the buoyancy of the smoke and stack effect.

4. The wooden paneling in the guards station of the visitor's room contributed to the rapid flame propagation and smoke development.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationships existing between phenomena, formulated from systematic observations. This incident study report has been developed from a varied number of systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The special relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure has been observed. From these systematic observations, the hypotheses has been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study:

The reported and documented outcomes of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral actions alternatives available to the participants.

A. Behavior Expectation Hypotheses

(The officer detecting the fire directed the visitor to leave, and notified the control center for assistance for a small fire.)

1. The correctional officers appeared to expect the fire to be easily extinguished and perceived the fire incident as posing a negligible threat.

(Correctional officers initiated two unsuccessful attempts to suppress the fire with extinguishers.)

2. The correctional officers appeared to expect to be able to extinguish the fire with extinguishers, due to the accounts of the appearance of the fire.

(The correctional officers obtained breathing apparatus and nonfire service masks to facilitate their evacuation and search of the first floor.)

3. The correctional officers appeared to not expect the quantity and type of heavy smoke created in this fire incident at the first floor level.

B. Alternative Behavior Hypotheses

(The Correctional Captain, after the second extinguisher extinguishing attempt, ordered the first floor evacuation, and the notification of the fire department.)

1. The decision of the Correctional Captain to initiate the complete evacuation of the first floor and to notify the fire department appeared to be motivated by a concern for the welfare of the staff, and to have been directly influenced by the facility training and emergency procedures.

65. WILSON HEALTH CENTER, JUNE 25, 1980

A series of three fires occurred in the Wilson Health Care Center, 301 Russell Avenue, Gaithersburg, Maryland in the early morning hours of June 25, 1980. The fires were all of undetermined, suspicious origin and all occurred in patient room 239, located on the second floor of the southwest wing. The Wilson Health Care Center is a portion of the Asbury Methodist Home Complex. The building of fire resistive construction was initially constructed in 1973 and the southwest wing involved in these fire incidents was constructed in 1980. The southwest wing is protected with combination smoke detectors and door closers on the patient room doors, wet pipe sprinkler system (7) class III standpipe system (11) smoke barrier doors in the corridors and extinguishers distributed according to standard practice. (10)

The initial fire incident was detected after the flames had self extinguished in a metal waste container in room 239 at approximately 0015 hours. The plastic liner of the waste container was replaced and the container was removed from the room to the nurses station. This fire incident is not analyzed in this report due to the incipient nature of the incident.

The second fire incident identified in this report as Incident One, was detected at approximately 0118 hours by the operation of the combination smoke detector and door closer on the door to patient room 239. This fire involved the cotton mattress, bedding and the vinyl covering of the foot board of the occupied patients bed located closest to the window. The patient in the bed apparently left the room immediately prior to operation of the smoke detector and went to the lounge area adjacent to the nurses station. The staff responded to the room, evacuated the remaining patient, phoned the fire department and also suppressed the flaming mattress by application of a listed (14) 2A, 10BC rated (10) dry chemical extinguisher. The Gaithersburg Volunteer Fire Department provided the first arriving engine and truck company, which was supported by two additional engine companies and medical units from both Rockville and Gaithersburg. Fire and police department personnel with the nursing staff evacuated both the north and southwest second floor wings to the first floor. This evacuation involved approximately 26 patients. The two patients in room 239 were transported to the Shady Grove Hospital, for minor smoke inhalation and they were kept for observation until approximately 0900. The fire department completed extinguishment of the mattress

fire with a 2 inch fire department hose line from the class III standpipe system (11) in the southwest stairway. The fire department ventilated the room of origin and the southwest wing following extinguishment by portable fans and by opening windows. The bed, mattress and bedding were removed from the building, the window left open and the door closed to room 239 which was then left vacant..

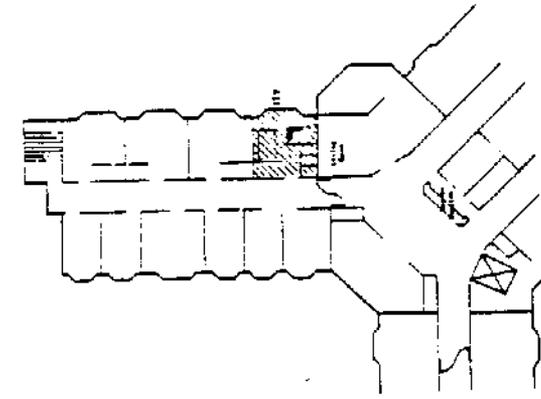
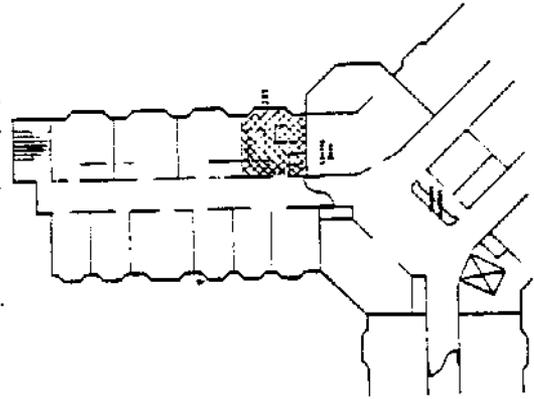
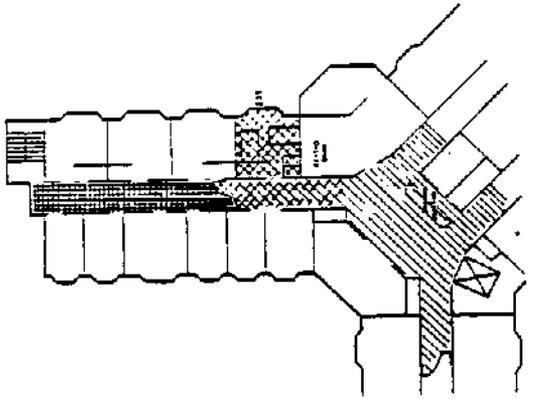
At approximately 0448 hours a nursing assistant noticed water flowing from under the door of room 239 to the corridor and at approximately the same time the local alarm system (8) was activated by the water flow switch of the wet-pipe sprinkler system. (7) The staff notified the fire department, closed patient room doors in the north wing and awaited the fire department since the room was unoccupied and there was no smoke in the corridor. The Gaithersburg and Rockville Volunteer Fire Departments responded with three engine companies, two truck companies, two rescue squads and medical units. Fire department personnel found two ordinary rated pendent heads on the wet pipe sprinkler system (7) had operated, extinguishing the fire in a combustible wardrobe cabinet. The fire department performed overhaul with salvage operations and restored the sprinkler system to service. Six patients were evacuated in this fire incident from adjacent rooms on the first and second floors until the water could be cleaned up from the sprinkler system discharge.

CONCLUSIONS

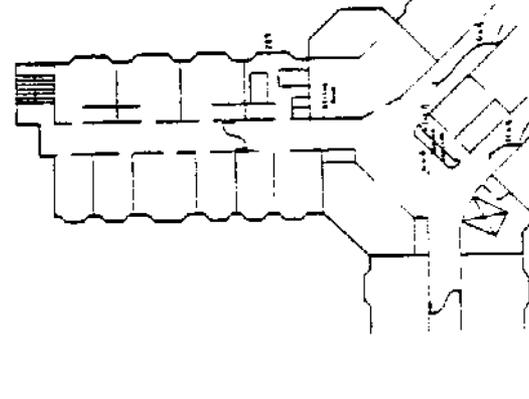
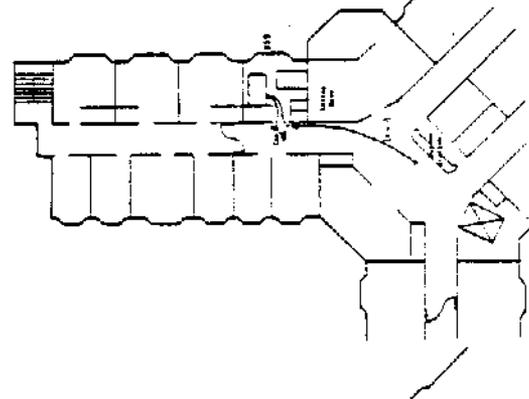
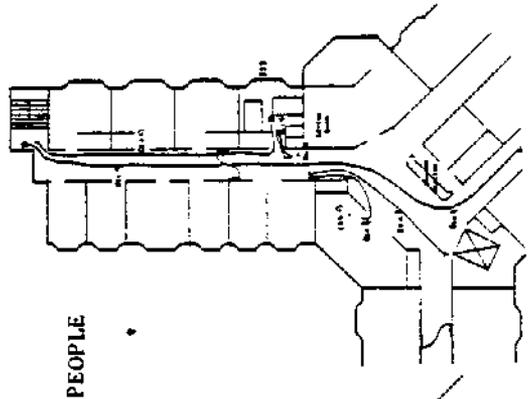
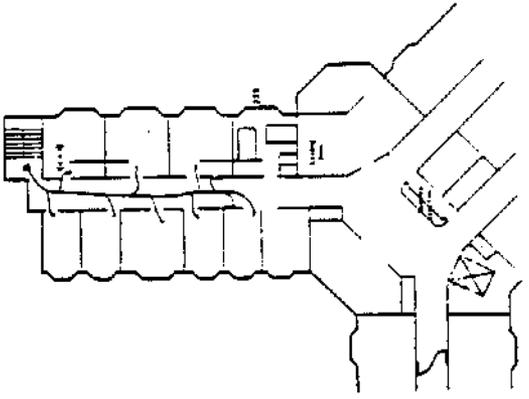
A. Behavioral Episodes

1. The facility emergency procedures were promptly initiated and followed in both fire incident one and two, prior to any investigation or confirmation of an actual fire incident.
2. A fire department officer apparently ordered the evacuation of the south wings as a precautionary measure, due to the lack of explicit information concerning the extent of the fire in incident one.
3. The staff rescue of the patient from room 239 was effectively accomplished, apparently as a result of previous training with the staff concern and responsibility for the safety of the patients in incident one.
4. The effective control and flame suppression in the first incident by the nursing assistant with the listed (14) dry chemical 2A,10BC rated (10) extinguisher appeared to be an effective and adaptive response.

Readings 1.2.3 and Episode 1.2.3.4, Incident One



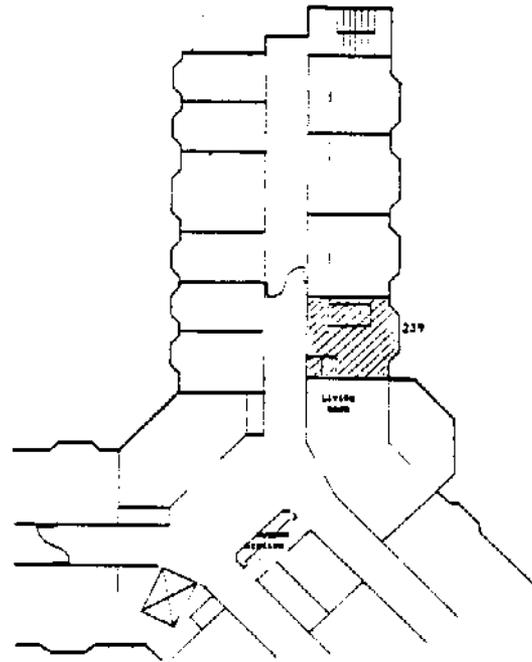
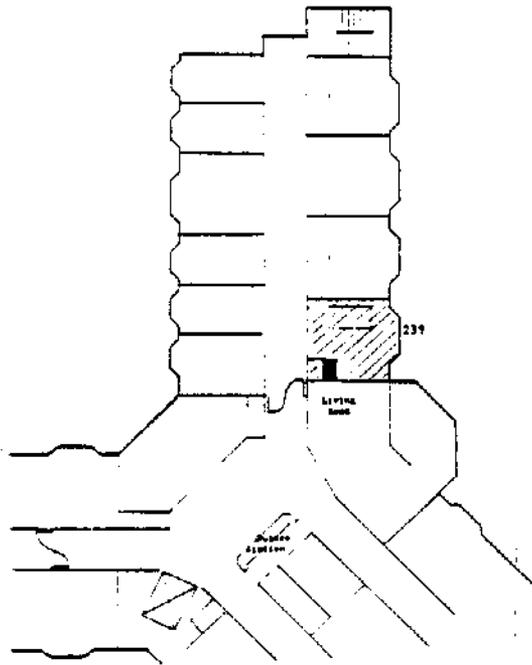
FIRE



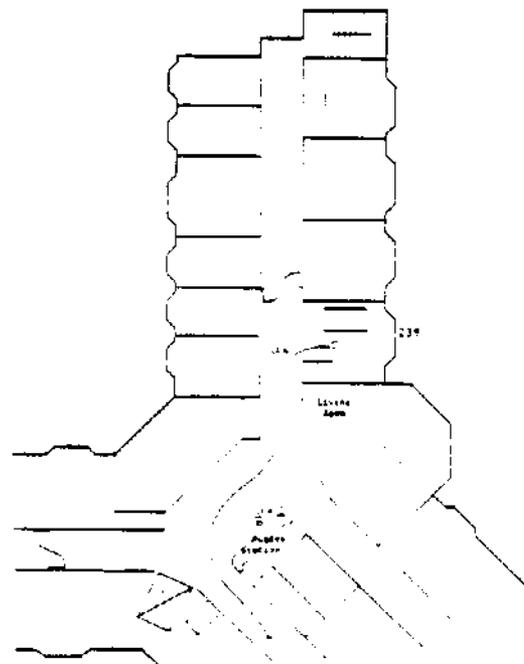
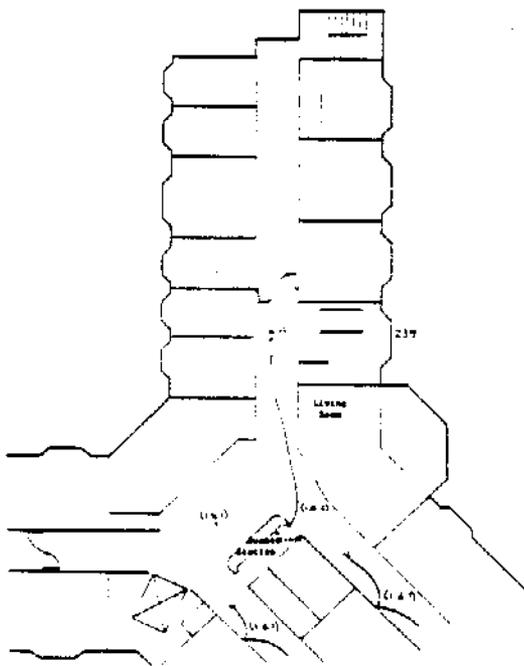
PEOPLE

Realms 1,2 and Episodes 1,2, Incident Two.

FIRE



PEOPLE



B. Fire and Smoke Realms

1. There was no appreciable smoke spread into the corridor from room 239, the room of fire origin, in fire incident one until the room door was opened.

2. There was no smoke in the corridor in incident two due to operation of the wet pipe sprinkler system (7) and the open room window.

3. The local alarm system, (8) smoke detectors, and wet pipe sprinkler system (7) operated properly and effectively as designed.

4. The listed (14) dry chemical 2A,10BC rated (10) extinguisher was properly maintained and operated effectively as designed. The operation of the extinguisher by the unfamiliar staff member was apparently facilitated by the simplicity of operation.

5. The extinguishment of the fire in the combustible wardrobe cabinet in incident two was facilitated by the cabinet door being open and the position of the cabinet relative to the two opened sprinkler heads.

HYPOTHESES DERIVED FROM THE STUDY

Hypotheses are predictions as to the relationship existing between phenomena, formulated from systematic observations. This incident study report has been developed from systematic observations. Participants in the fire incident have related their behavioral experience as they recalled the experience. The special relationship and geometric configuration within the structure and the fire area has been examined. The physical evidence of the fire and smoke propagation within the structure have been observed. From these systematic observations, the hypotheses have been formulated and are presented to enable the determination of the uniqueness or generality of the behavioral phenomena in this fire incident.

These hypotheses are derived from the examination of the following two parameters of this study.

The reported and documented outcome of the behavioral actions of the participants in relation to the participant's reported expectations of the outcomes of the behavioral action.

The reported behavioral actions of the participants in relation to the behavioral action alternatives available to the participants.

A. Behavior Expectation Hypotheses

Incident One

(The charge nurse and two nursing assistants went to room 239 to investigate the activation of the smoke detector.)

1. Having experienced the previous waste can ignition in room 239 the staff appeared to expect the fire incident to again have originated in room 239.

(The charge nurse felt the door knob and door surface prior to opening the door to room 239.)

2. As an apparent result of training and experience the charge nurse expected the hand to be sensitive to the transmission of heat through the knob and surface of the door.

Incident Two

(The nursing staff closed doors in the north wing and awaited the fire department at the second floor nurses station.)

1. The nursing staff appeared to expect the wet pipe sprinkler system (7) to control or extinguish the fire, and they also knew no patients were in the room of fire origin due to incident one.

B. Alternative Behavior Hypotheses

(The nursing assistant entered room 239, picked up the roommate from the bed and carried her from the room.)

1. The effective and adaptive rescue of the patient from room 239 appeared to be a behavior in accordance with the facility emergency procedures and the staff's concern for the welfare of the patients.

(The nursing assistant entered about three feet into room 239 and discharged the listed (14) 2A, 10BC rated (10) dry chemical extinguisher on the flames from the mattress and bedding.)

2. The nursing staff apparently discussed the advisability of applying the extinguisher to the mattress fire, and applied the extinguisher to reduce the threat to the additional patients in the wing, since the incident did not appear to require immediate evacuation of all the patients.

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APPENDIX

PROJECT PEOPLE II

HEALTH CARE ADMINISTRATION

1. Number of Beds _____
Number of Patients at Time of Incident _____
Number of Staff at Time of Incident _____
Nursing _____ Dietary _____ Housekeeping/Maintenance _____
Average Staff/Patient Ratio _____
2. Patient Population Characteristics
Mobile _____ Age Range _____
Not Mobile _____ Average Age _____
Not Movable _____
Limited Mobility _____
3. Staff Training _____
Conducted By _____
Frequency _____
Content _____
4. Loss: Building _____ Contents _____
5. Casualties: _____ Location _____
6. Staff/Patient Routines in Fire Area _____
7. Total Number Evacuated _____ From: _____
To: _____
Evacuation Time: _____
8. Obtain Copy of Fire Safety Plan for Facility: _____
9. Fire Department Notified Y _____ N _____ Why _____

PROJECT PEOPLE II
HEALTH CARE STAFF

- Occupation _____ Incident Identification _____
- Position at time of incident _____ Time at facility _____
- National Origin _____ Sex _____ Age _____ Language Problem _____
1. Do you believe the building to be safe? Y _____ N _____ Why? _____
 2. How did you first become aware there was a fire? _____
 3. Where were you when you realized there was a fire? _____
How close were you to the fire? _____
 4. What did you do when you realized there was a fire? 1. _____
2. _____ 3. _____
 5. Did you evacuate any patients? Y _____ N _____ How many? _____ Did anyone assist you?
Y _____ N _____ Who? _____ From what area rooms? _____
How did you evacuate? _____
Condition of patients? _____ Ambulatory _____ Non ambulatory _____
Patients restrained Y _____ N _____ NBS Categories: Mobile _____ Not mobile _____
Not movable _____ Limited mobility _____ Where evacuated to? _____
_____ Was there any visible smoke? Y _____ N _____ Any odor? Y _____
N _____. Did you evacuate patients through smoke? Y _____ N _____ How far through smoke?
_____ feet. Any problems or aids in evacuation? _____
 6. Did you return to the fire area Y _____ N _____ Before the fire was extinguished? Y _____
N _____ Why? _____
 7. Did you try to move through the smoke? Y _____ N _____ Where _____ How far did you
try to move? _____ feet. How far could you see at the time _____ feet. Smoke
became thicker? Y _____ N _____ Did you see when you turned back? _____ feet.
 8. Did you notice lighted exit signs? Y _____ N _____ Color of signs? _____
 9. Did you hear the fire alarm or detectors operate? Y _____ N _____ When? _____
 10. Did you see smoke or fire doors closing? Y _____ N _____ When? _____ Where? _____
 11. Previous training on actions to take in a fire: Number of times taken? _____
Type? _____ Given by? _____ Last course? _____
 12. Number of times involved in fire before? _____ Last previous occurrence? _____

PROJECT PEOPLE II
Part II. The Person and The Fire

Occupation _____ Incident Identification _____

National Origin _____ Sex _____ Age _____ Language Problem _____

1. Do you believe the building to be safe? Y _____ N _____ Why? _____
2. How did you first become aware there was a fire? _____
3. Where were you when you realized there was a fire? _____ Room or Apt. # _____
How close were you to the fire? _____
4. What did you do when you realized there was a fire? 1. _____
2. _____ 3. _____
5. Did you voluntarily leave the area _____ floor _____ bldg. _____ during the fire?
Y _____ N _____ When? _____ How? Stairway _____ Elevator _____ Balcony _____
Escape _____ Window _____ Door _____ Other _____ Was this your
usual way? Y _____ N _____ Did you leave by: Own Efforts? Y _____ N _____ Assisted:
By Others _____ By Fire Department _____ Is this most direct route? Y _____ N _____
If No, explain on back of sheet.
6. How fare did you travel in leaving? _____ feet
7. Did you return to the area _____ floor _____ Bldg. _____, before the fire was
extinguished? Y _____ N _____ Why? _____
8. Why did you not leave the bldg. - area? _____
9. Was there any visible smoke? Y _____ N _____ Any odor? Y _____ N _____ Did you try
to move through the smoke? Y _____ N _____ How far did you try to move? _____ feet.
How far could you see at the time? _____ feet. Smoke become thicker? Y _____ N _____
Did you see when you turned back? _____ feet.
10. Did you notice lighted exit signs? Y _____ N _____ Color of signs? _____
11. Did you hear the fire alarm or detectors operate? Y _____ N _____ When? _____
12. Previous training on actions to take in a fire: Number of times taken? _____
Type? _____ Given by? _____ Last course? _____
13. Number of times involved in fire before? _____ Last previous occurrence? _____
14. Any obstructions to egress from bldg.? _____
15. Any aids to egress from bldg.? _____
16. Please report any additional comments on the back of this paper.

ADDENDUM

Facility	Incident Date	Summary on Page	NBS Report No. NBS-GCR	NTIS Order No. PB	No. of Pages in Report
1. St. Joseph's Hospital	8/10/77	13	78-140	-287935	65
2. Kensington Gardens	1/01/78	18	79-159	-290892	66
3. Manor Care, Hyattsville	1/10/78	22	80-206	80-183221	53
4. Manor Care, Adelphi	3/01/78	25	80-207	80-185739	42
5. Manor Care, Adelphi	3/01/78	28	80-208	80-183205	41
6. Harford Memorial	3/09/78	31	80-209	80-181654	47
7. Sacred Heart	3/19/78	34	80-205	80-183212	43
8. Magnolia Gardens	4/02/78	37	80-211	80-187578	43
9A. Univ. of MD Hospital	4/26/78	40	80-212	80-185770	47
9B. Univ. of MD Hospital	4/27/78	40	80-212	80-185770	47
9C. Univ. of MD Hospital	4/27/78	40	80-212	80-185770	47
9D. Univ. of MD Hospital	4/27/78	40	80-212	80-185770	47
9E. Univ. of MD Hospital	4/28/78	40	80-212	80-185770	47
9F. Univ. of MD Hospital	4/28/78	40	80-212	80-185770	47
9G. Univ. of MD Hospital	5/01/78	40	80-212	80-185770	47
9H. Univ. of MD Hospital	5/05/78	40	80-212	80-185770	47
9I. Univ. of MD Hospital	5/06/78	40	80-212	80-185770	47
9J. Univ. of MD Hospital	5/07/78	40	80-212	80-185770	47
9K. Univ. of MD Hospital	5/08/78	40	80-212	80-185770	47
10. Anne Arundel General	5/01/78	41	80-213	80-187859	27
11. Lorien	5/07/78	43	80-214	80-187917	35
12. Manor Care, Largo	5/09/78	45	80-215	80-187909	32
13. American	5/11/78	47	80-216	80-192677	45
14. Anne Arundel General	5/11/78	50	80-217	80-192669	31
15. Allegany County	5/16/78	52	80-218	80-194863	47
16. Sligo Gardens	6/10/78	55	80-219	80-191018	41
17. Avalon Manor	6/16/78	58	80-220	80-179054	36
18. St. Anne's	6/20/78	61	80-221	80-197262	26
19. Maryland General	8/08/78	63	80-222	80-195704	28
20. Manor Care, Largo	8/14/78	65	80-223	80-195605	36
21. North Arundel	9/04/78	68	80-224	80-197254	29
22. Manor Care, Towson	10/18/78	71	80-225	80-194293	29
23. Lafayette Square	10/24/78	73	80-226	80-195621	30
24A. Sheppard Pratt	10/25/78	76	80-227	80-195944	36
24B. Sheppard Pratt	10/26/78	76	80-227	80-195944	36
25. Anne Arundel General	11/14/78	79	80-228	80-195811	30
26. Washington Adventist	12/09/78	81	80-229	80-196025	29
27. Spring Grove	12/14/78	83	80-230	80-199235	30
28. Washington Adventist	12/22/78	85	80-231	80-207905	31
29. Southern Maryland	1/02/79	88	80-232	80-207343	33
30. Georgian Towers	1/09/79	91	79-187	80-148596	45
31. Crownsville	1/26/79	94	80-233	80-208986	28
32. University of MD	2/06/79	97	80-234	80-204993	29
33. Sheppard Pratt	2/07/79	100	80-235	80-207897	27
34. Pikesville	2/08/79	102	80-236	80-204985	20
35. Ellicott City	2/14/79	105	80-237	80-207889	28
36. Hidden Brook	2/15/79	108	80-238	80-209059	32
37. Montgomery General	3/28/79	111	80-239	80-207335	28
38. University of MD	4/04/79	113	80-240	80-205651	29
39. Sheppard Pratt	4/05/79	115	80-241	30-207236	32
40. Taylor House	4/11/79	118	80-200	80-179054	42

Facility	Incident Date	Summary on Page	NBS Report No.	NTIS Order No.	No. of Pages in Report
41. University	4/13/79	122	80-191	80-158157	39
42. Kensington Gardens	4/14/79	125	80-242	80-207228	26
43. Thurston Hall	4/19/79	127	80-193	80-163017	44
44. NIH	4/21/79	131	80-192	80-177264	43
45. Roosevelt Hotel	4/24/79	135	80-253	80-220429	36
46. Mt. Wilson	6/10/79	138	80-262	80-218092	32
47. Bethesda Health Ctr.	6/12/79	142	80-263	80-218423	27
48. Franklin Square	6/13/79	146	80-260	80-218076	29
49. MD Masonic Home	6/21/79	150	80-243	80-203672	31
50. Sheppard Pratt	6/24/79	154	80-244	80-206204	26
51. Reeder's Memorial	7/29/79	157	80-264	80-218100	29
52. Union Hospital	7/29/79	160	80-261	80-218084	25
53. Crownsville	8/19/79	163	80-265	80-218118	32
54. Mt. Wilson	9/04/79	167	80-266	80-218357	30
55. Finan Center	9/09/79	171	80-267	80-218845	35
56. Peninsula General	9/22/79	175	80-270	80-218381	38
57A. Crownsville	10/05/79	179	80-268	80-218415	41
57B. Crownsville	10/12/79	179	80-268	80-218415	41
58. Crownsville	10/12/79	184	80-269	80-219009	30
59. Gunston School	11/30/79	188	80-271	80-218407	35
60. Sheppard Pratt	12/10/79	192	80-272	80-224090	32
61. Fallston General	1/27/80	195	80-273	80-218399	40
62. Chesapeake Hall	2/03/80	199	80-275	80-218373	43
63. Washington Adventist	3/05/80	204	80-274	80-224918	25
64. Patuxent Institute	3/05/80	208	80-276	80-218365	40
65A. Wilson Health Center	6/25/80	212	80-277	80-224934	50
65B. Wilson Health Center	6/25/80	212	80-277	80-224934	50

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16. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.) This report is a summary and initial analysis of the sixty-five fire incidents included in the study population of Project People II. The fire incidents have been analyzed to present in tabular form the descriptive characteristics of the facilities with the construction, interior finish, and fire zone features shown. Staff and fire department behavioral actions were summarized and are presented in another table, with the number of persons evacuated, the means of evacuation, the extinguishment behavior, the closing of doors and the ventilation of smoke through the facility windows. The fire protection features of the facilities are presented in a third table. The sixty-five fire incidents included in this summary occurred between August 10, 1977 and June 25, 1980. The facilities involved in the incidents have primarily been health care facilities in accordance with the objectives of the research study, with twenty-five nursing home or convalescent center and thirty-three hospital incidents. In addition, two schools, two high rise apartments, two university dormitories and one correctional institution fire incidents were included due to the extensive evacuation behavior. The abstract of each fire incident report is presented with the diagrams of the maximum fire and smoke development in the realms and the movements of personnel in the behavioral episodes. The individual fire incidents were studied with a survey of the facility and interviews with critical fire department, staff and patient personnel.		13. Type of Report & Period Covered Final	
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