Humberside Fire and Rescue Service

STANDARD OPERATING PROCEDURES FOR

**Fighting fires in
High Rise Buildings**

S.O.P. No. 3.2

PRODUCED BY:

*OPERATIONAL SUPPORT
SERVICE HEADQUARTERS*

Introduction & Range

Generic Risk Assessment

Control Measures

Aide-Memoir

OPERATIONAL PROCEDURE DETAILS		
DESCRIPTION	**SOP No.**	**REVIEW**
Fighting fires in High Rise Buildings	**3.2**	**Issue Date : November 2007**
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OPERATING ENVIRONMENT		
1. **Incident ground** - **Fires and special services** 2. **Training venues** - **On and off station venues**		

INTRODUCTION

RISK ASSESSMENT

The Service has a duty to make a suitable and sufficient assessment of the health and safety risk to employees and others who may be affected by their actions and to provide employees with comprehensive and relevant information on risks identified.

This assessment identifies the hazards, risks and controls that relate to incidents involving High Rise Buildings

HOW TO USE THIS STANDARD OPERATING PROCEDURE

This document has been designed to be read easily, quickly and with only ESSENTIAL information included. The following pages contain the information that all operational personnel MUST know.

The cover of this procedure has on it four coloured boxes, each relating to a specific section. Simply identify the section you want to look at then turn to the appropriate coloured heading(s).

This information about High Rise Buildings is available to personnel in the following form:

- Operational Aide-Memoire (carried on appliances and by FDS officers)
- Appliance Mobile Data Terminals
- The Intranet (via 'Library – Documents – Standard Operating Procedures')

RANGE OF DOCUMENT

Firefighters attending incidents involving high rise buildings will generally be involved with fires and special services at multi storey buildings such as domestic dwellings, hospitals, hotels, industrial and commercial premises. Therefore this procedure should be read in conjunction with:

- **Fire Service Manual Volume 2, Fire Service Operations – Incident Command**
- **Technical Bulletin – 1/1997, Breathing Apparatus – Command and Control Procedures**
- **Service Orders 10 - Health & Safety - Risk Assessment Arrangements, Dynamic Risk Assessment**

- **SOP No. 2.2 Rescues from lifts and escalators**
- **SOP No. 3.6 Ventilation**
- **SOP No. 5.8 Flashover/backdraught**

For Fire Service purposes, a high rise building may be considered as one which contains floors at a height that external rescue and firefighting are not feasible. Due to limited access for aerial appliances, many buildings of 5 floors and over will be classed as high rise.

The basic design principle is based on sub-division and compartmentation. Provided any communicating openings are sealed, the size, development and spread of fire will be limited.

Personnel involved in firefighting may have to climb a number of staircases before reaching the scene of operations.

Falling Objects

- Lightweight forms of construction cannot be expected to have as high a degree of fire resistance as the more substantial brick and concrete forms.

- Many forms of curtain walling are pre-fabricated in sections which are later 'hung' on the framework of the building. This introduces a potential weakness from the fire aspect.

- Debris from the site may present a significant hazard in that even a small piece of the structure falling will accelerate to its terminal velocity and can travel some distance away from the building.

- Glass, in particular large sheets of glass from curtain walling and windows, may 'plane' a considerable distance. In addition, falling debris may be ejected explosively from the fire.

The Effects of Wind

High rise buildings cause complicated wind patterns to build up, especially between high blocks, slab blocks and low buildings, with the result that a small breeze can be magnified and channelled into fast-moving eddies and currents, by the resistance of the buildings to the air flow. The wind can cause fire to spread some considerable distance, even spreading to floors that are separated.

BRIEF DESCRIPTION OF ACTIVITIES OR TASKS TO BE ASSESSED

HAZARD CHECKLIST	L*	S*	R*
1. Fall of person from height			
2. Fall of object or material from height	M	H	H
3. Fall of person on same level (slip or trip)			
4. Manual handling	H	M	H
5. Machinery hazards (cuts, abrasions, entanglement, friction)			
6. Operation of vehicles			
7. Fire	M	H	H
8. Electricity			
9. Drowning			
10. Excavation work (where this is part of the task)			
11. Stored energy			
12. Explosions (chemicals or dust)			
13. Contact with excessively hot or cold surfaces			
14. Compressed air or gases			
15. Mechanical lifting operations			
16. Noise			
17. Biological agents			
18. Radiation Non-Ionising			
19. Radiation-Ionising			
20. Excessive vibration			
21. Use of hand tools			
22. Adverse weather conditions (where exposure is part of the task)			
23. Hazardous Substances			
24. Storage, stacking or shelving			
25. Housekeeping			
26. Lighting levels (too high, too low, glare, rapid changes)			
27. Confined spaces			
28. Cleaning (before, during or after the task)			
29. Use of display screen equipment (as part of the task)			
30. Lone or unaccompanied working			
31. Exposure to personal violence or aggression			
32. Flashover/backdraught	L	H	M

This is the first part of the Risk assessment. When considering the hazards at this stage you must mentally remove the controls that are in place, as it is easy to consider that a task is of low likelihood or severity because the risk is already being controlled. The danger of this is that this incidental control may not be appreciated and may be removed by changing operators. Hazards with a risk rating of **HIGH** or **MEDIUM** are considered to be significant findings and require transferring onto the risk assessment record, to be re-assessed taking into account persons at risk and control measures put into place. If no significant findings are identified i.e. all hazards have a risk rating of **LOW** the risk assessment need proceed no further and the record kept for reference purposes.

				RISK ESTIMATE L x S			RISK RATING	ADDITIONAL CONTROLS REQ. Y/N

ACTIVITY High Rise Buildings   **EQUIPMENT**   **LOCATION:**   **REF No. 3.2**

No	HAZARD	PERSONS AT RISK	CONTROL MEASURES	L	x S		RISK RATING	ADDITIONAL CONTROLS REQ. Y/N
2	Fall of object or material from height	A, D, E	• Cordon off hazard area. Identify hazard area with cordon tape. • Prevent access to hazard area. • All personnel to receive information, instruction and training fighting fires in high rise buildings. • Appoint safety officers to watch for falling debris. • PPE.	L	H		M	N
4	Manual Handling	A, D	• Assess route to be travelled, avoid slip and trip hazards. • Use fixed installation if available. • Reduce weight to be carried by individuals. • Information, instruction and training in manual handling techniques.	M	L		L	N
7	Fire	A, D, E	• Have charged hose ready to use before entering compartment. • Consider use of correct door opening techniques. • PPE, BA, leave no skin exposed. • Minimum number of personnel in risk area. • Training, pre planning, exercises, instruction and information on firefighting in high rise buildings.	L	M		L	N
32	Flashover/ backdraught	A, D, E	• Establish hazard zone. • Use fixed installations if available. • Follow correct backdraught/flashover procedures. • PPE, BA, leave no skin exposed. • Information, instruction and training in signs and symptoms of flashover/backdraught.	L	M		L	N

ASSESSMENT DATE	
REVIEW DATE	
ASSESSORS NAME RANK No.	

PERSONS AT RISK CODE	
A – OPERATIONAL PERSONNEL	**D** – OTHER AGENCIES PERSONNEL
B – CONTROL PERSONNEL	**E** – MEMBERS OF THE PUBLIC
C – NON-UNIFORMED PERSONNEL	**F** – YOUNG PERSONS

LIKELIHOOD

HIGH – *Expected*

MEDIUM – *Possible it will happen sometime*

LOW – *Improbable (rarely/never)*

SEVERITY

HIGH - *Fatality/disabling injury*

MEDIUM – *A period of absence with full recovery*

LOW – *Minor injury allowing people to stay at work*

RISK ESTIMATOR

Severity

		HIGH	MEDIUM	LOW
Likelihood	**HIGH**	HIGH	HIGH	MEDIUM
	MEDIUM	HIGH	MEDIUM	LOW
	LOW	MEDIUM	LOW	LOW

RISK RATING

LOW	NO ADDITIONAL CONTROLS REQUIRED, CONSIDERATION MAY BE GIVEN TO A MORE COST EFFECTIVE SOLUTION OR IMPROVEMENT THAT IMPOSES NO ADDITIONAL COST BURDEN. MONITOR TO ENSURE THAT CONTROLS ARE MAINTAINED.
MEDIUM	EFFORTS SHOULD BE MADE TO REDUCE THE RISK, BUT COSTS OF PREVENTION SHOULD BE CAREFULLY MEASURED AND LIMITED. RISK REDUCTION METHODS INCLUDE SAFE SYSTEMS OF WORK, INFORMATION, INSTRUCTION, TRAINING, SUPERVISION, PPE.
HIGH	WORK SHOULD NOT BE STARTED OR CONTINUED UNTIL THE RISK HAS BEEN REDUCED USING THE HIERARCHY OF CONTROL MEASURES SUCH AS ELIMINATION, SUBSTITUTION, ISOLATION, REDUCTION ETC. IF IT IS NOT POSSIBLE TO REDUCE THE RISK EVEN WITH UNLIMITED RESOURCES, WORK HAS TO REMAIN PROHIBITED.

CONTROL MEASURES

TRAINING

All personnel should be given information, instruction and training relating to the hazards presented by high rise buildings and should therefore undertake a regular programme of training sessions and exercises at high rise premises in their station area. Consider developing exercises to simulate worst case scenarios i.e. communications failure, lift failure, Fire Service personnel shut in lift due to mechanical failure, defective dry riser or premises pump failure.

Clearly identify the minimum equipment required for dealing with high rise incidents and the most effective method of moving/transporting this equipment to the bridgehead.

Training should allow crews to rehearse the safe systems of work described below and should adhere with the principles of operational training.

Further relevant information can be found in:

- Educational materials provided by the Learning and Development Section.
- Fire Service Manual Volume 2-Fire Service Operations-Compartment Fires and Tactical Ventilation.

PRE-PLANNING

Regular inspections and familiarisation visits of all high rise buildings in the station area should be carried out. Points of interest will be:

- Name of premises.
- Approach roads.
- Access for appliances.
- Rendezvous points.
- Access to buildings.
- Fire alarm annunciator panels and zone plans.
- Floor numbering.
- Compartment numbering.
- Locations of keys for access to hose reels, dry risers, pump rooms, firefighters switch.
- Location of lift and lift motor rooms, lift controls and firefighters switch.
- Fixed installations. Dry riser inlets and drain valves, Hose reel isolation valves.
- Protected staircases, landings and lobby areas.
- Isolation switches.
- Location of hydrants.
- Any particular hazard e.g. complicated layout, security doors, and occupants.
- Any fixed installation communication equipment.

The information gained will afford the Incident Commander a degree of accuracy when carrying out a dynamic / analytical risk assessment during the initial stages of the incident.

Control should be informed if engineers, specialist information and / or key holders are required for each premises.

DYNAMIC RISK ASSESSMENT

The Incident Commander should carry out a comprehensive Dynamic / Analytical Risk Assessment and adequately brief crews prior to deployment. However, a continuous risk assessment must also be carried out by all personnel on the incident ground.

The following should be considered as part of the Dynamic Risk Assessment process:

- The height of the floor involved.
- Nature and size of the fire.
- Water supplies.
- The need to start up BA in fresh air.
- Resources available to implement safe system of work.
- Safety of personnel ahead of bridgehead.
- Rescues.
- Evacuation.
- Local knowledge.

OPERATIONAL CONSIDERATIONS

Initial Actions

If there is a firefighter's switch fitted to the lifts, take control of all the lifts and have them stationed at ground level. If the lifts are suitable they may be used by Fire Service personnel Some lifts may only stop at alternative floors.

If there is no firefighters switch the lifts should not be used but called to the ground floor and made inoperable e.g. the doors wedged open. The Incident Commander should ensure that all personnel are informed that the lifts are not to be used.

If the premises has a dry riser locate riser inlet box and nearest hydrant. Provide water supplies from the hydrant to riser via the appliance pump. If there is no dry riser, implement locally established plan to provide water to the fire floor.

Establish a suitable BA Entry Control Point location at ground level.

Provide 2 BA wearers with appropriate equipment.

After assessing all available information, the Incident Commander will identify an appropriate floor to establish a Forward Control Point. A Bridgehead must be established at least two floors below the fire floor.

BA wearers are to start up their sets confirm communications with the ECO and proceed to the floor identified as a bridgehead by the Incident Commander.

If lifts are inoperable or there is no firefighters switch, the bridgehead and BAECP will be established using the staircase by two personnel in BA, but not under air, and the ECO with communications to the Incident Commander.

On arrival at the identified floor:

- Confirm communications.
- Assess suitability of floor for use as a Forward Control Point, if floor is unsuitable, proceed to the floor below and reassess.
- Forward Command Point and BAECP are to be established on the identified floor. Inform the Incident Commander via the ECO. The Incident Commander should ensure all personnel are kept up to date.
- Conduct a DRA and if assessed as safe to do so, prepare fire fighting equipment and commence firefighting operations.

Second appliance in attendance

- Report to Incident Commander; if a third pump is not in attendance; assist in providing water supplies as required.
- The OIC of second appliance, 2 BA wearers, a lift operator and the ECO should proceed to Forward Control Point.

As the Incident Develops

As the incident develops, Analytical Risk Assessments must be produced. The Incident Commander must ensure that all personnel on the incident ground are aware of the hazards. When handing over command of the incident, the officers involved must ensure an effective briefing takes place.

- The Incident Commander will take charge of all operations at ground level and ensure that no unauthorised persons gain access to the risk area at the incident by establishing and maintaining an appropriately sited cordon.
- Ensure the utility services are isolated to the affected compartment.
- A reconnaissance of all sides of the building should be conducted and the OIC of Forward Control Point informed of any relevant information.
- The lift operator should return to the ground level to transport any additional personnel and equipment resources required on to the identified floor.

Third appliance in attendance

- Report to Incident Commander at the ground floor level Control Point. Assist in providing water supplies as required.
- Provide additional equipment (if required) to the Forward Control Point
- Assist in the control of movement of personnel and other agencies entering risk area
- Provide 2 BA wearers at the Forward Control Point.
- Further actions as directed by the Incident Commander.

Other Considerations

PPV post fire. Assess floors above the fire floor for smoke logging.

Individual compartments may remain smoke free if the doors to the compartment are kept shut. The Incident Commander should consider leaving the occupants in place. Occupants should be questioned about the situation inside their compartments. If occupants are to be left in their compartments regular checks must be made on their welfare. If it is considered that the safety of occupants is or could be compromised they must be evacuated.

A fire involving the first four floors may be treated as a Low Rise property if ladder access can be achieved.

The Forward Control Point and the ground floor level Control Point must have an identified individual in charge at all times.

If the Officer in Charge of the second appliance attending is of a more senior role to that of the initial Incident Commander the most senior officer will assume command and remain at ground floor level.

All subsequent attending resources

- Report to the ground floor level Control Point for deployment/briefing instructions.
- All personnel committed to firefighting and rescue operations to report to Forward Control Point for briefing as to allocated task.

Post Incident

- Consider Community Fire Safety advice for neighbouring properties.
- All equipment used will require standard testing and the test recording.
- Complete and forward Analytical Risk Assessment forms to the Operational Support Section.
- Conduct a Post Incident Debrief and forward a Post Incident Review for any significant findings to the Operational Support Section.

AIDE MEMOIR

Access
Nature and size of
the fire
Water supplies
Safe systems of work
Safety of personnel
ahead of bridgehead
Rescues
Evacuation
Local knowledge

RISK ASSESSMENT

- The height of the floor involved.
- Contained to one compartment or spreading to other floors or compartments.
- Dry riser, hydrant, hose reels or no fixed installation.
- Bridgehead at least two floors below fire floor.
- IC to remain at ground floor, OiC of second appliance to be at FCP.
- Casualty handling, casualty carer.
- Lead other occupants to safest exit route.
- Appliance positioning, access points, fixed installations, annunciator panels etc.

Firefighters switch

Take control of all the lifts by operating firefighter switch.

No firefighters switch

Do not use the lift, call to the ground, make inoperable e.g. wedge doors open.

Dry riser

If the premises has a dry riser, connect to nearest hydrant via the appliance pump. If there is no dry riser implement locally established plan to provide water to the fire floor.

Entry Control Point

Establish a suitable BA Entry Control Point location at ground level.

BA Wearers

Provide 2 BA wearers with appropriate equipment.

INITIAL ACTIONS

The Incident Commander will identify an appropriate floor for a Forward Control Point. A Bridgehead must be established at least two floors below the fire floor.

Proceeding to
bridgehead

BA wearers to start up, confirm communications with the ECO, proceed to the bridgehead.

Lifts inoperable or
No firefighters switch

Bridgehead and BAECP established using the staircase by two personnel in BA, not under air and the ECO with communications to the Incident Commander.

On arrival at bridgehead

Communications

Assess floor for FCP

Inform IC of location
Of bridgehead

- Confirm communications.
- Assess suitability of floor for use as a FCP, if floor is unsuitable, proceed to the floor below and reassess.
- FCP and BAECP are to be established on the identified floor. Inform the Incident Commander via the ECO.
- Conduct a DRA and if assessed as safe to do so, prepare fire fighting equipment and commence firefighting operations.

DRA, commence task
Second appliance
in attendance

- Report to Incident Commander; assist in providing water supplies as required.
- OIC of second appliance, 2 BA Wearers, the lift operator and the ECO should proceed to the FCP.

Analytical Risk Assessments

The Incident Commander

The lift operator

Third appliance in attendance

Analytical Risk Assessments must be produced. Ensure that all personnel on the incident ground are aware of the hazards.

- The Incident Commander will take charge of all operations at ground level.
- Ensure the utility services are isolate to the affect compartment.
- Examine all sides of the building.
- The lift operator should return to ground level to transport any additional resources.

- Report to Incident Commander. Assist in providing water supplies as required.
- Provide additional equipment (if required) to the Forward Control Point
- Provide 2 BA wearers at the FCP.
- Further actions as directed by the Incident Commander.

PPV

Evacuation

OiC of second of appliance

PPV post fire. Assess floors above the fire floor for smoke logging.

Individual compartments may remain smoke free. Consider leaving the occupants in place. Conduct regular checks on their welfare. If the safety of occupants is or could be compromised they must be evacuated.

If the Officer in Charge of the second appliance attending is of a more senior role to that of the initial Incident Commander, the most senior officer will assume command and remain at ground floor level.

Community fire safety

Equipment

Analytical Risk Assessment

Post Incident Debrief

- Consider Community Fire Safety advice for neighbouring properties.
- All equipment used will require standard testing and the test recording.
- Complete and forward Analytical Risk Assessment forms to the Operational Support Section.
- Conduct a Post Incident Debrief and forward a Post Incident Review for any significant findings to the Operational Support Section.