Northern Ireland
Fire & Rescue Service

STANDARD OPERATING PROCEDURE NO 40

Rescue of Trapped Persons

Version Number:	2
Version Date:	19 November 2014
Issued by:	Emergency Response Department

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VERSION CONTROL

This document and subsequent amendments will be issued by the Emergency Response Department, Northern Ireland Fire & Rescue Service Headquarters.

Amendments are detailed as below:

No	Issued	Amendment	Prepared by	Approved by
1	04/07/2014	New Standard Operating Procedure (SOP) - consultation	Project Team	Assistant Chief Fire Officer (ACO) Ashford
2	19/11/2014	Issue of SOP following approval	Project Team	ACO Ashford

1 INTRODUCTION

1.1 Scope

This SOP has been developed to contribute to a safe system of work for incidents where persons are trapped and require release.

The scope is primarily concerned with the following types of entrapments:

- Persons trapped in machinery, either in enclosed premises or in the open, such as industrial machinery, lift mechanisms, escalators, farming machinery, combine harvesters and baling machinery, etc.
- Minor entrapments - persons trapped in baths, limbs or toes trapped, persons trapped in railings or elements of a building, etc.
- Removal of articles - rings, handcuffs, or other articles temporarily affixed to the body. It includes the removal of other articles, on medical advice, whether on the incident ground, or in hospital operating theatres, etc.

This SOP is not applicable to incident types which are addressed by separate SOPs:

- SOP 4 - Water Rescue;
- SOP 26 - Confined Space/Rope Rescue.

1.2 Pre-determined Attendance (PDA)

Resources mobilised to the rescue of trapped persons will depend largely on the information provided by the caller and will be scaled up or down as appropriate.

Pre-defined PDAs are:

Incident Type	**PDA**
Persons trapped in machinery	▪ 1 Pump and 1 Rescue Pump (minimum total number of riders – 11); ▪ 1 Flexi Duty System (FDS) Officer; ▪ 1 Safety Officer will be mobilised to significant incidents.
Persons trapped in railings	▪ 1 Pump; ▪ 1 Rescue Pump; ▪ 1 FDS Officer.
Removal of articles	▪ 1 Pump.

2 SIGNIFICANT HAZARDS AND CONTROL MEASURES

Significant Hazards	Control Measures
▪ Mechanical hazards - Entanglement; - Friction and abrasion; - Cutting or shearing; - Stabbing or puncture; - Impact; - Crush; - Drawing-in.	▪ Consult with site specialist Engineers prior to commencing operations. ▪ Isolate power before working. ▪ Use Sharps kit. ▪ Stabilisation. ▪ Machine guards only to be removed once it is confirmed that power has been isolated and moving parts have stopped. ▪ Do not override safety devises such as brakes and safety interlocks before careful consideration of the effect of their release. ▪ Specific hazards and safe systems of work to be identified through consultation with the on-site experts/specialists.
▪ Non-mechanical hazards - Chemical; - Electrical; - Noise and vibration; - Pressure/vacuum; - Inhalation of mist or vapour; - Ionising radiation; - Biological or bacterial; - Temperature extreme; - Lasers.	▪ Personal Protective Equipment (PPE). ▪ Eye protection. ▪ Respiratory protection. ▪ Ear defenders. ▪ Identification of hazards. ▪ Isolation.
▪ Blood born infections - Hepatitis B; - HIV; - Respiratory infection.	▪ PPE. ▪ Medical gloves. ▪ Eye protection. ▪ Respiratory protection. ▪ No eating, drinking or smoking without washing hands. ▪ Wash hands at end of the incident. ▪ Decontaminate fire kit.

Significant Hazards	Control Measures
▪ Electricity - Electric shock; - Arcing; - Fire; - Burns; - Electrostatic charge; - Capacitors.	▪ Seek the advice of the site Engineer and persons on site. ▪ Isolate power supplies. ▪ Use insulated tools and electrical gloves. ▪ Request Engineer to earth systems. ▪ Request Northern Ireland Electricity to attend, if time permits. ▪ CO^2 extinguisher standing by.
▪ Pneumatic - Air embolisms when air is forced through the skin; - Physical injury to the hearing or eyes from sudden pressure release; - Flying particles propelled by compressed air.	▪ Seek the advice of the site Engineer and persons on site. ▪ PPE. ▪ Ear protection. ▪ Eye protection. ▪ Isolate air supplies to plant. ▪ Ensure that any parts that can move are fully supported or locked off prior to isolation of any air supply.
▪ Hydraulic - Fluid ejected at high pressure; - Epidermal injection wound - fluid forced into bloodstream or surrounding tissue at high pressure; - Eye/skin injuries cause by general contact; - Leakage of hydraulic fluid increasing slip, trip and fall hazard; - Inhalation of mists or aerosol.	▪ Seek the advice of the site Engineer and persons on site. ▪ PPE. ▪ Eye protection. ▪ Use respiratory protection if mists or aerosol are released. ▪ Isolate hydraulic supplies to plant; ▪ Cone off spills. ▪ Never cut hydraulic cables.
▪ Stored energy caused by a blockage and when removed causing a sudden release	▪ Seek the advice of the site Engineer and persons on site. ▪ Fully assess risks prior to making cuts, undoing bolts or fastenings. ▪ Limit numbers in the Hazard Area. ▪ Crews to be fully briefed of the hazards of collapse or sudden movement.

Significant Hazards	Control Measures
▪ Manual handling of equipment; ▪ Bariatric or heavy patients.	▪ Correct manual handling techniques used at all times. ▪ Clear pathways and make sufficient space prior to moving items. ▪ Consider the use of an Aerial appliance. ▪ Consider Specialist Rescue Team (SRT) attendance.
▪ Noise	▪ Ear protection. ▪ Switch off machines. ▪ Use ear piece system for radios.
▪ Trauma/psychological stress	▪ Monitor for signs. ▪ Remove persons from scene if identified. ▪ Post-incident follow-up. ▪ Critical Incident De-brief to be initiated post-incident.
▪ Confined spaces; ▪ Trench collapse.	▪ Lighting. ▪ Make-up for SRT. ▪ Frequent rotation of personnel to ensure their welfare. ▪ Implement SOP 26 - Confined Space/ Rope-Rescue incidents.
▪ Irrespirable/flammable atmospheres	▪ Breathing Apparatus must be used. ▪ Ventilate. ▪ Eliminate ignition sources. ▪ Make-up for a Hazmat Officer and gas monitor. ▪ Minimum numbers in risk area.
▪ Heat	▪ Use mechanical ventilation (positive pressure fan). ▪ Ventilate.
▪ Drowning	▪ Implement SOP 4 - Water Rescue procedures.
▪ Working at height; ▪ Cranes.	▪ Implement SOP 27 - Working at Height procedures. ▪ Consider SRT attendance.
▪ Animals hazards, for example, at farm incidents - Bites, kicks or crush injuries	▪ Task persons on site to remove animals. ▪ Make-up for trained Farm Animal Handling Awareness (FAHA) Officer. ▪ Implement SOP 22 - Large Animal Rescues procedures.

Significant Hazards	Control Measures
▪ Potential suicides; ▪ Members of the public becoming agitated or violent.	▪ Full PPE including medical gloves. ▪ Establish and maintain cordons. ▪ Consider the use of Aerial appliances. ▪ Request Police.

3 OPERATIONAL CONSIDERATIONS

3.1 EN ROUTE

Mobilise

- Don PPE.
- Carry ear protection and medical gloves.

Immediate Considerations

- Confirm type of premises.
- Confirm an ambulance is en route, if required.
- Consider additional Fire Service resources you may require on arrival.
- Brief crew and allocate roles.
- Consider hazards likely to be present.

Think through the phases of the Incident Plan

- Identify responsible person.
- Scene safety.
- Ensure all machinery is isolated.
- Early casualty contact.
- Stabilisation.
- Determine resource needs.
- Strict Inner Cordon.
- Kit dump.
- A and B Plan and casualty care.
- Extrication.
- De-brief.

Officer-in-Charge Considerations

- Focus on safety throughout.
- Liaise with other agencies.

Arrival

- Careful approach.
- Safe appliance positioning.
- Dismount on the safe side.

3.2 IN ATTENDANCE

Initial Actions

- Gain information from persons on site, location of persons trapped, building layout, safe routes, hazards, expertise on site, etc.
- Confirm if Operational Risk Card is available on the Mobile Data Terminal.
- Determine resources needed.
- Prioritise objectives, plan, communicate and control.

Informative Message

- Send an early informative message, stating nature of the incident, Tactical Mode and make up as appropriate.

Brief Crews

- Brief crews on the priorities and plan, hazards and control measures.

Safe Route

- Liaise with persons on site to escort crews along safe routes.

Isolate Equipment

- Close liaison with site Engineer and persons on site to isolate all equipment.
- Cover or cordon exposed areas of danger with suitable temporary measures.
- Secure moving parts.
- Gain a full appreciation of the workings of the machine, the history of its movement and subsequent entrapment of the casualty.
- Allow equipment to cool if possible.

Casualty

- Maintain continual contact with the casualty, reassure them and inform them of actions being undertaken.
- Ensure a medical team is in place prior to any attempted removal of trapped casualties.
- Use all available information from on-site expertise and medical colleagues.
- Maintain correct manual handling techniques throughout.
- Reassure, monitor and review wellbeing throughout.

Inner Cordon

- Set up an Inner Cordon.
- Strictly control persons entering and exiting.
- Persons/other agencies to have correct appropriate PPE when entering cordon.
- Request Police to keep unauthorised persons outside of the cordon.
- Crowds/bystanders to be removed and kept at a safe distance.

Lighting

- Use scene lights, portable lighting.
- Prepare in advance for darkness.
- All personnel to have their own helmet torch.

Equipment Pool

- Set up an area to store equipment and items removed from machinery.
- Area to be close to scene of operations but not so close that it may create an additional trip hazard.

Initial Rescue

- Liaise closely with Northern Ireland Ambulance Service (NIAS).
- Prioritise objectives.
- Brief crews on control measures and actions throughout.

Continually Re-evaluate

- Incident information.
- Resources information.
- Hazards and safety information.
- Think.
- Prioritise objectives.
- Plan.
- Communicate and control.

Complete Rescues

- Treat casualties.
- Hand over to NIAS.

Make Safe

- Ensure equipment is left in a safe condition, or cordoned off.

Handover

- To occupier, Police Service of Northern Ireland, or other agency.

Stop Message

- Send stop message.

De-brief

- Carry out a Hot De-brief.
- Brief crew on Critical Incident De-brief procedure if appropriate.
- Identify training needs.

3.3 POST-INCIDENT

Critical Incident De-brief

- An officer will carry this out where appropriate.

De-brief

- Carry out and feedback as appropriate.

Equipment Issues

- Replenish items used.
- Submit defects.
- Source replacement equipment via District.

Accident or Near Misses

- Accidents to be fully investigated and reported as per normal procedures.
- Near misses to be reported as per normal procedures.

Medical Attention

- Medical attention to be sought as appropriate.

Decontamination of Personnel and Fire Kit

- Standard procedures to be followed.

Incident Recording Form (IRF)

- Complete IRF within 21 days.

4 PRE-INCIDENT PREPARATION

4.1 Relevant Literature

This SOP is supported by the following supporting information, which is available from the Global Folder at G:\Document Management System:

- Incident 05 - Lifts and Escalators;
- Operational 4 - Special Service Calls;
- Operational 5 - Specialist Rescue Calls;
- RTC 10 - Hydraulic Rescue Equipment;
- RTC 11 - Air Mats and Air Bags;
- RTC 16 - Lukas Support Set;
- Operational Aide-Mémoire.

4.2 Training

The following training shall be carried out, in accordance with the Area Training Planner, to prepare in advance for rescues of trapped persons:

- Application of the Decision Making Model.
- Incident Command procedures.
- Practical drills on station, use of road traffic collision equipment, setting up equipment dumps, casualty handling, use of stretchers, etc.
- Manual handling training.
- First Aid and First Person on Scene (FPOS) training.
- Awareness lectures on procedures to prevent "crush syndrome" for casualties who have been trapped for an extended period.
- Use of spine boards.
- Awareness of Critical Incident De-brief procedure and support mechanisms.

All training must be recorded on the Tracking & Training database to provide an effective audit trail.

4.3 Pre-planning

It is vital that personnel carry out pre-planning activities as follows:

- Site visits to lifts and escalators and their motor rooms to gain knowledge and understanding of different types, safety features, control rooms, control panels, location of operating instructions and operating equipment.
- Gain knowledge of the additional resources that can be called on to assist.
- Monitor road closures and determine alternative routes.
- Test, maintain and stow safely all PPE and equipment.
- Record PPE checks in PPE Log Books to provide an effective audit trail.
- Record weekly/monthly/quarterly equipment tests to provide an effective audit trail.