



Assurance of Evacuation Times by TEMPSC from Offshore Installations

Technical Note

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List of abbreviations

Abbreviations	Definitions
ACoP	Approved Code of Practice
ERP	Emergency Response Plan
GPA	General Platform Alarm
HSE	Health & Safety Executive
IMO	International Maritime Organisation
NUI	Normally Unattended Installation
OEM	Original Equipment Manufacturer
OIM	Offshore Installation Manager
PAPA	Prepare to Abandon Platform Alarm
PFEER	Prevention of Fire and Explosion, and Emergency Response
POB	Personnel on Board
PPE	Personal Protective Equipment
TEMPSC	Totally Enclosed Motor Propelled Survival Craft

Applicable legislation and guidance

Legislation	Requirement
<u>Offshore Installations (Prevention of Fire and Explosion, and Emergency Response) Regulations 1995 (PFEER) Regulation 5(2)(c):</u>	The duty holder shall perform an assessment including the establishment of appropriate standards of performance for effective evacuation, escape, recovery and rescue to avoid or minimise a major emergency.
<u>PFEER Regulation 15(b):</u>	The duty holder shall ensure that such arrangements are made which include to the extent necessary – such arrangements with suitable persons beyond the installation, as will ensure, so far as reasonably practicable, the safe evacuation of all persons.

Guidance	Link to Website
SN 01/2006 (revised) Ensuring adequate safety during davit lifeboat drills, testing and maintenance on UK offshore installations	SN 01/2006
Training for emergencies on offshore installations - Offshore Information Sheet No. 1/2014 (Issued February 2014)	OIS No. 1/2014

1 Introduction

As part of the process of sampling compliance by duty holders with legal requirements and their own accepted offshore installation safety cases, the Health & Safety Executive (HSE) has a responsibility to evaluate how duty holders assure themselves that the evacuation times stated in their Emergency Response Plan (ERP) are realistic and achievable in practice. Installation operators, the onboard workforce and wider relevant stakeholders including the public are entitled to reasonable confidence that the ERP accurately reflects the time needed to ensure, so far as is reasonably practicable, the safe and successful evacuation of all persons should this be necessary in an emergency.

In the event of a major fire and explosion incident, or helideck unavailability owing to listing or structural failure, it is unlikely it will be possible to evacuate all personnel by helicopter promptly, particularly where installations have large numbers on board that are more distant from helicopter bases. The Offshore Installations (Prevention of Fire and Explosion, and Emergency Response) Regulations 1995 (PFEER) allows for this in Regulation 15 Approved Code of Practice (ACoP) paragraph 205, which requires duty holders to have an alternative means of evacuation when the normal means of getting people to and from the installation could not operate because of “*c) insufficient capacity to evacuate everyone in the time available*”. The usual alternative means of evacuation is a totally enclosed motor propelled survival craft (TEMPSC), which means the safety and reliability of this system is vital.

HSE interventions have revealed evidence that a significant proportion of duty holders are unable to demonstrate through evidence from exercises that their installations can be evacuated in practice using the installed TEMPSC within the time stated in the ERP. To be able to demonstrate legal compliance, HSE expects duty holders to position themselves to show, and give confidence through evidence, that the stated timings for evacuation can be achieved – and that the arrangements have been tested – in practice.

The Health and Safety at Work etc Act 1974, Sections 2(1) and 3(1) by virtue of 2(2)(d), impose a duty on every employer to ensure, so far as is reasonably practicable, the health, safety and welfare at work of all its employees (and persons not in their employment but affected by their undertakings) so far as is reasonably practicable as regards any place of work under that employer’s control, for the provision and maintenance of means of access to and egress from it that are safe and without such risks. PFEER Regulations 4, 5, 8, 15 and the accompanying ACoP, impose on duty holders a legal requirement to ensure that their evacuation (and escape) arrangements for an offshore oil and gas installation are effective.

The Offshore Installations (Offshore Safety Directive) (Safety Case etc) Regulations 2015 (SCR2015) Regulation 2(d) defines “*major accident*” as “*any other event arising from a work activity involving death or serious personal injury to five or more persons on the installation or engaged in an activity on or in connection with it*”.

The HSE does not consider it foreseeable that TEMPSC release hooks will spontaneously release during a TEMPSC loading or training exercise and as such the loading or training exercise does not constitute a major accident hazard, provided that:

- The TEMPSC release system a) meets the latest International Maritime Organisation (IMO) standards; and b) Is maintained in accordance with Original Equipment Manufacturer (OEM) instruction; and
- There is no intervention such as testing or performing maintenance of the release system during the loading or training exercise.

2 Recommendations for enabling a demonstration to confirm legal compliance

The HSE recommends that duty holders perform an exercise, or series of exercises, the purpose of which is to collect sufficient evidence to demonstrate that each of their individual installations can be evacuated by TEMPSC within the time stated in the ERP. The outcome of the exercises may be subject to sampling inspections by the HSE to verify that the requirements of PFEER are being met. If a duty holder is unable to provide this evidence, the HSE will consider action in accordance with the HSE's Enforcement Policy Statement. This may require the duty holder either to demonstrate that the evacuation time stated in the emergency response plan can be achieved, or to revise the response plan to reflect the practically realistic evacuation time discovered from exercises.

Duty holders must select the most appropriate method of performing the exercises based on their individual installations and evacuation arrangements. When determining the time it takes to load a TEMPSC, duty holders may elect to fully load the craft or they may elect to load the craft only partly and extrapolate the result. In any event, the exercise should be performed in a safe and realistic manner.

The exercise should be performed for each installation, other than identical NUI's visited by a common workforce. In this case the results of exercises on one NUI can be assumed to be the same on other comparable NUI's. If there are different designs of TEMPSC on a single installation the duty holder should determine which TEMPSC will take longest to load and use that craft in their demonstration.

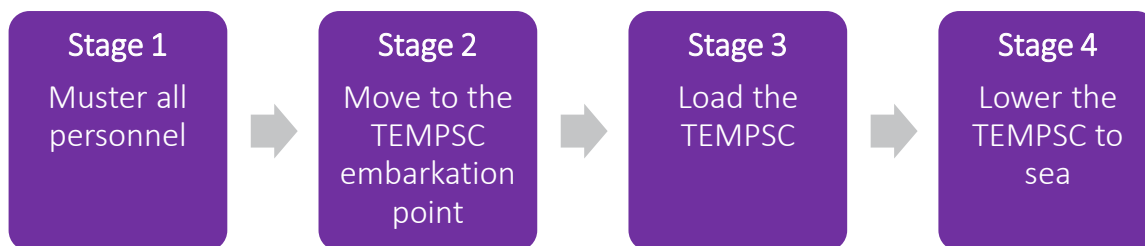
Exercises to demonstrate the time it takes to evacuate the installation by TEMPSC should form part of the PFEER Regulation 5 Assessment and as such should be repeated at the same interval, or whenever there are changes to the evacuation arrangements which could impact on the time it takes to evacuate.

Section 3 provides some practical and pragmatic information on how such a demonstration can be safely achieved.

For the purpose of this guidance the evacuation time is considered to be the interval between the Offshore Installation Manager (OIM) deciding to evacuate by TEMPSC, which is usually signalled by sounding the General Platform Alarm (GPA) or Prepare to Abandon Platform Alarm (PAPA) (depending on individual company policy) and the TEMPSC being lowered to sea level.

3 Demonstration

HSE considers evacuation by TEMPSC to consist of the following four stages:



Dependant on the ERP, the donning of appropriate personal protective equipment (PPE), (lifejacket, immersion suit, helicopter transit suit, etc) should be included in the above timings whether this is carried out at the primary muster point or TEMPSC embarkation point.

The time required to perform stage 1 and 2 of evacuation can be demonstrated through drills and exercises. The time taken to achieve full muster of personnel and move all personnel to the TEMPSC embarkation point should be recorded for routine drills and made available to the HSE inspector if requested during inspection. Duty holders need only consider the times from the point when the OIM decides to evacuate the installation. In most cases coxswain checks and TEMPSC preparation are performed simultaneously to stage 2. If the duty holder policy is to perform these checks after stage 2 but before stage 3 then the additional time must be added to the overall evacuation time.

For stage 3, one method of demonstrating the time required for evacuation is to record the time taken to fully load the TEMPSC with personnel wearing the required PPE. Another method is to partially load the TEMPSC and extrapolate the result. This would be considered an acceptable method providing the method for doing so is robust and based on sound mathematical principle.

Duty holders who have fitted identical TEMPSC (the same make, model and capacity) on more than one installation need only perform the stage 3 exercise on one of those installations and use the results for the other installations.

Stage 3 may also include the foreseeable need to evacuate a stretcher-bound casualty and include the time it takes to transfer a casualty into the TEMPSC. For exercises where transferring a stretcher bound casualty is included; the following cumulative timing shall be included taken from place of embarkation:

- For TEMPSC designed to accept a stretcher; time taken to transfer and make secure the stretchered casualty;
- For TEMPSC having specially design seating arrangements for casualties; time taken to transfer casualty from stretcher to TEMPSC seating in accordance with OEM’s instructions;
- For TEMPSC without designated facilities, time taken to transfer casualty from stretcher to TEMPSC seating and secure.

A possible method of performing a partial loading exercise is suggested in section 4. Stage 4 of evacuation can be calculated using the descent rate of the TEMPSC, recorded during periodic load

testing or other maintenance activity when there are no persons in the TEMPSC. Duty holders operating installations with free-fall TEMPSC should estimate the time required to launch the boat. Duty holders are not expected to lower a twin-fall or free-fall TEMPSC as part of an evacuation exercise or the TEMPSC loading exercise.

4 Partial loading and method of extrapolation

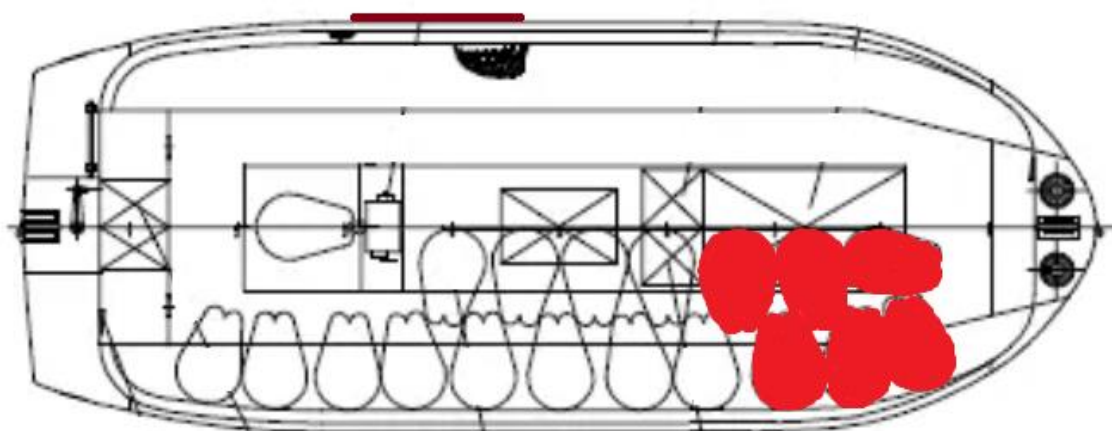
The following description is a suggested method for part-loading a TEMPSC and extrapolating the result.

When considering methods to calculate the time taken to fully load a TEMPSC duty holders must make the process as realistic as possible, by using enough personnel to give a worthwhile representation of a boat being loaded to capacity, using a cross section of the workforce, thereby including persons who may be less familiar with the TEMPSC. It is recommended that a duty holder wishing to perform the exercise with fewer than five persons in the TEMPSC first discusses their approach with HSE.

The method should replicate any restrictions or bottlenecks that would slow the loading process, such as restricted access through the access hatch and the movement of persons through the TEMPSC.

It should include the possibility that persons may be loaded in adjacent or opposite seats from each other or in tiers above each other and the effect the confined space will have on the loading rate. This can be simulated by loading persons into a small section of the TEMPSC rather than spread around the empty seats (see Figure 1).

Figure 1: Example of part-loading a TEMPSC.



When planning and performing the evacuation exercise duty holders should consider any factors likely to slow the evacuation process and replicate them in the exercise as far as possible. This includes, for example, possible congestion in the routes to the TEMPSC/ at the embarkation area where more than one TEMPSC may muster, donning PPE in congested spaces, and the possibility of having to transfer a casualty into the TEMPSC. In scenarios where the installation is being evacuated before an event resulting in casualties occurs, such as immediately before vessel collision, it will not be necessary to include the time required to load a stretcher.

Loading exercise example:

Select a suitable number of persons assigned for the exercise ensuring there is a cross section of the workforce, including transient contractors, and locate them at the TEMPSC embarkation point. Start the timer and instruct all personnel to don their lifejackets and any other PPE required. Once the first person is ready, under instruction from the coxswain or muster-checker, instruct them to enter the TEMPSC and proceed to the furthest seat from the access hatch and strap themselves into the seat. As soon as the second person is ready to enter the TEMPSC instruct that person to follow the first person and sit in the next available seat. Repeat this process until all persons are strapped into adjacent seats, recording the overall time taken to load the persons. Repeat this exercise as often as necessary until sufficient data has been established.

Using this data calculate the average amount of time it took the group to enter the boat and strap themselves into their seats. Extrapolate this figure to the capacity of the TEMPSC and add the time it took to load a stretcher and any other additional factors specific to the installation. The capacity of the TEMPSC is the maximum number of persons assigned to the TEMPSC, which may be less than the maximum number of seats.

5 Realistic and reflective exercises

Duty holders must consider the many different ways in which people may react to an emergency, and other factors that may slow the TEMPSC loading process, which cannot be replicated during the loading exercise. The action of people in an emergency has been the subject of countless studies and it is foreseeable that people under stress will not act the same way in an emergency and in a training exercise. Duty holders should ensure that the outcome of the exercise is realistic and reflects the time it may take to evacuate the installation. Where, for example, the timings differ between exercises the duty holder should lean towards the longer timing. Duty holders should also take into account the maximum POB of the installation and ensure the results of the exercise take account of that.



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