



TR/PFEER Integrity Test Training

What does PFEER Stand For?

SI No. 1995/743 The Offshore Installations (Prevention of Fire, Explosion and Emergency Response) Regulations 1995.

What does TR stand for?

Temporary Refuge.

Why do we test the TR?

We test the TR to prove that this volume can be used as a safe haven on the Offshore Installation in the case of a major incident, and in doing so we assist the Licence Holder / Operator in proving the platforms safety case.

How do we do this?

We do this by pressurising the TR to +50Pa and then measuring the amount of air which we then put into the module, this additional air is the amount of air leaking out of the TR through Fire Damper, Door Seals, cable penetrations etc. We then depressurise the TR to -50Pa and measure the air we are blowing into the TR, we depressurise the module so that the door seals are pulled against the sealing face. Once we have the pressurise and depressurise figures, we then take the average, and this is what is used to calculate the air change rate (ACHR)

What is a pass figure?

This pass figure is usually found in the Platform Safety Case and is usually 0.2 **Air Changes per Hour** for new platforms and 0.35 Air Changes Per Hour for older platforms. This figure should be given to us by the client, it is not our responsibility to say what this figure should be, we can usually give advice on this figure.

What are the usual areas that Fail?

The usual areas of failure are door seals, cable glands not being packed properly, HVAC fire dampers and pipe penetrations not sealed properly. The following are areas which have been found while looking for sources of leakage "mouse holes" around deck stiffeners, A60 wall panels which have moved (with the movement of the platform), platform stiffener sealing panel moved away from bulkhead.

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Testing Procedure

Below is the method for carrying out the TR Integrity Test.

Measure the TR Volume (L x B x H)m³

Subtract 5% for solids from this figure (this is an average for solid volumes i.e. chairs, cabinets etc.) Multiply this volume by the allowable leakage rate, this will give the allowable leakage rate per hour, m³/hr, (divide this by 3600 to give m³/s)

At the same time you measure the TR Volume also look around for any obvious signs of leakage, also look for any tell-tale signs of leakage (i.e. dust tracks on the bulkheads).

Make a list of all bulkhead penetrations including HVAC Fire Dampers which require to be closed during the Integrity Test. Ask if is possible for the platform to 'stroke' these Fire Dampers prior to the test being carried out, as it is highly likely that a couple of the dampers will not operate correctly.

N.B: Ducting below 0.02m² does not require having a Fire Damper fitted (SOLAS regulations) if this is the case where ducting passes between the TR Boundary and non-TR take a note of this area and discuss this with the platform personnel and onshore personnel.

Identify a suitable door which the Door Fan Frame can be installed into, two 240v 3 pin plug power points are also required, one for the 110v step down transformer and the other for the computer.

Ensure that all shower drains / floor drains etc... are full of water.

Identify all the HVAC systems which require to be switched off, include any systems which serve space adjacent to the TR.

Wind speed is recommended to be below 6 m/s. (this is an onshore industry standard).

Ensure that tannoy announcements are made prior to the commencement of the test, letting personnel know that there will be access / egress from the TR for the duration of the test, duration of the test could be as long as 2 hours.



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Carrying out the test.

Ensure that all the test equipment is located near the test door inside the module.

Set up the door frame inside the module following the numbers marked on the doorframe.

Set up the computer and instruments near the door fan.

Get the HVAC and Fire Dampers previously identified switched off/closed. Ensure that the Fire Dampers identified earlier are closed, ensure that the doors are all closed correctly.

Set up the doorframe in the door, ensure that the nylon 'door' is located between the door frame and fan frame, put the differential pressure hose through the hole in the nylon door frame, ensuring that this hose is out with the airstream.

Fit the fan into the door frame ensuring that the fan is supported on the middle frame also ensure that the airflow is in the required direction. Ensure that the elasticated hole in the nylon door is pulled around the fan.

Connect the cable and hose to the fan, connect the power cable to the fan speed controller, and connect the power cable to the gauge.

Switch on the power ensuring that the fan is switched off, switch on the gauge and select the correct setting (Pa and Pa)

Prior to switching on the fan remove some of the covers as per photographs at the back of the software operating manual.

Input the relevant data into the software. Names, Companies locations etc. Next page on software input the volume to be tested.



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On test ensure that in the Manual Test Setup fields that the direction is set to test in both directions and that the operator is set to In The Room. Ensure that the fan ranges are set i.e. C2, C4, C8 etc... If the fan speed or range is too low the software will display a LOW error message, you will have to change to a similar range.

Enter the Barometric Pressure from the Barometer wind speed, ambient temperature and inside temperature prior to commencement of the test.

Take the static pressure readings, ensuring that these readings are within operation limits as set by software.

Switch on the fan and set the static pressure to approx. 50Pa. Wait approx. 5-10minutes while the pressure forces the door seals against or away from the door frames.

Start to take the Room pressures (static pressure) and the flow pressures (velocity pressure) and enter these into the computer software.

After entering all the data into the row, the fan requires to be turned around and proceed as above until all the data has been entered into the software.

At this point press the calculate button and then view the results pages, on these pages look at the airflow rate and the air change rate lines, these will let you know if the TR has passed the PFEER Integrity test or not.