

Fast Rescue Craft unplanned descent

What happened?

NOPSEMA conducted an investigation into a dangerous occurrence on an offshore facility in which a Fast Rescue Craft (FRC) carrying four workers was being recovered to its davit following a routine marine operation. The FRC was raised 23 metres from sea level and was stopped at deck level to allow tag lines to be secured to the craft before final hoisting into the FRC davit cradle.

When hoisting resumed, the FRC started to descend to the sea. The FRC winch operator initially released the hoist control to the neutral position at which point the davit brakes should have been applied, but the FRC continued to descend to sea at a rate governed only by the inertia brake in the system. It was reported that the winch operator then actuated the hoist-up control to the full speed position but the FRC descent rate increased. The emergency stop was activated but the FRC continued to descend until contact was made with the sea. No injuries were sustained by the occupants and no equipment was damaged as a result of this dangerous occurrence. The sea condition was reported as 'smooth' (force 2) at the time.

The FRC has a maximum capacity of 10 persons and is used for both routine marine operations as well as providing an emergency response function, including recovery of man overboard, rescue of persons from ditched helicopters and marshalling life rafts. The FRC davit contains three braking systems, a mechanical brake, a hydraulic brake and a centrifugal/inertia brake. During the unplanned descent, both the mechanical and hydraulic braking systems failed to operate and the speed of descent was limited by the centrifugal/inertia brake only.

Investigation by the operator identified that three incorrect valves had been fitted to the davit hydraulic system. One of these valves, supplied incorrectly by a third party service provider (it contained one additional character in the part number), compromised the integrity of the hydraulic braking system. Prior to the dangerous occurrence, the FRC davit winch had undergone a significant overhaul by third party service providers, which included an original equipment manufacturer (OEM) service engineer. It was reported that following the overhaul, the FRC winch system was not load tested with either the FRC or water bags. The procedures used for the testing lacked detail and did not identify how testing was to be conducted, although the annual fitness for purpose certificate was issued by the OEM's representative for the FRC system. The operator's FRC testing procedures were not used during the FRC davit winch testing. It was later confirmed that had these procedures been followed, the failure mode would have been identified.

The OEM had not completed a failure mode effects and analysis (FMEA) or similar type study, to identify the effect of any single mode failures in the system. The operator had completed a generic type FMEA on the system but, after detailed review, this was found to be ineffective. The operator's FRC launching procedures did not address the operation of the FRC winch. The operator's FRC training conducted at the facility did not address routine or emergency winch operations. The facility winch operators were unable to explain all the control functions of the winch control panel, including for example, when to engage and disengage the 'wave compensation' function which was a feature of the system. Two previous FRC winch failures had occurred at the facility directly related to the failure mode identified as a consequence of this dangerous occurrence.

What could go wrong?

If the inertia brake failed to operate and slow the rate of descent, the manned FRC could have dropped 23 metres to sea, potentially resulting in multiple fatalities or serious injuries.

Key lessons

- Investigations conducted by the operator into two previous FRC winch failures did not detect the failure modes of these events.
- The risks associated with any single mode failures should either be removed or the risks reduced to as low as reasonably practicable.
- Consideration should be given to conducting a failure mode and effects analysis (FMEA) or similar type of study on FRC davit winch systems to identify the system failure modes.
- Planned maintenance and testing of FRC davit winches should effectively contribute to the prevention or mitigation of identified system failure modes and be linked to a facility's performance standards.
- In the absence of the application of an appropriate management of change process, spare parts should only be replaced with 'like for like' spare parts as per the original equipment manufacturers design.
- FRC launching, recovery and testing procedures should effectively address both routine and emergency FRC davit winch operations.
- Effective competency and training systems should be in place for FRC winch operators which address both routine and emergency davit winch operations.
- Operators should always comply with FRC davit winch testing and maintenance procedures.
- Processes should be in place to ensure that the maintenance, inspection and testing conducted by the third party service providers is effective and supported by appropriate procedures and documentation.
- Appropriate measures should be in place for monitoring compliance with and effectiveness of the testing arrangements being implemented.

The legislation

As per Clause 9 of Schedule 3 to the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*: "The operator of a facility must take all reasonably practicable steps to ensure that the facility is safe and without risk to the health of any person at or near the facility." This includes an obligation to take all reasonable practicable steps to:

- Implement and maintain systems of work that are safe and without risk to health [Clause 9(2)(d)];
- Provide all members of the workforce with the information, training and supervision necessary for them to carry out their activities in a manner that does not adversely affect the safety of persons at the facility [Clause 9(2)(f)].

Contact

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The Australian Transport Safety Bureau issued a report on a separate FRC incident which occurred on the vessel *British Sapphire* off the Northern Territory coast on 16 May 2010 and resulted in injuries to crew members. The ATSB report raised several similar findings to the key lessons arising from the dangerous occurrence detailed in this Safety Alert. For more information, go to investigation number [275-MO-2010-004](#) at atsb.gov.au