HFE CHECKLIST - ACCESS

	REQUIREMENT	REF.	COMMENTS	RECOMMENDATIONS	REF.	BY
1.1	**HORIZONTAL / VERTICAL DISTANCES**					
1.1.1	Are horizontal workspaces for fixed equipment minimum 700 mm?	NORSOK S-002, Annex B	Requirement satisfied (waste water tank)			
1.1.2	Are centre heights of control devices for standing operations (including valve handles) max. 1800 mm above base ? Are the centre heights of control devices for normal operation controls and for controls where access in an emergency is required 900-1500 mm above base?	NORSOK S-002, Annex B	Requirement satisfied (no normal operation of valve is expected)			
1.1.3	Are visual displays located 1100-2000 mm above floor level?	NORSOK S-002, Annex B	Requirement not applicable			
1.1.4	Is space between fixed cabinets and floor min. 250 mm (or preferably fixed on floor without space underneath)?	NORSOK S-002, Annex B	Requirement satisfied			
1.1.5	Are access ways to permanently and intermittently manned workplaces: - when technically practicable, min. 900 mm wide ? - In any case min 800 mm wide ?	NORSOK S-002, Annex B	Requirement satisfied (no normal/maintenance activities are foreseen in transition piece)			
1.1.6	Are vertical clearances in access ways min. 2100 mm? Are vertical clearances in primary/secondary escape route min. 2300 mm?	NORSOK S-002, Annex B	Requirement satisfied (TP ingress is considered as man hole access).			
1.1.7	Are vertical clearances in work areas and stairs min. 2300 mm?	NORSOK S-002, Annex B NORSOK C-002, 5.7	Requirement satisfied			
1.2	**PIPES AND FLANGES**					
1.2.1	Are spaces between pipe bottoms and floor min. 150 mm?	NORSOK S-002, Annex B	Requirement satisfied			
1.2.2	Are spaces between external diameter of flanges and fixed obstructions min. 250 mm?.	NORSOK S-002, Annex B	Requirement satisfied			
1.3	**GUARDRAILS**					
1.3.1	Are guardrails provided on elevations higher than 500 mm?	NORSOK S-002, Annex B	Requirement satisfied (guardrails provided in TP and interface level)			

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.3.2	Is height from floor to top of the guardrail min. 1100 mm?	NORSOK S-002, 5.1.2	Requirement satisfied (1100 mm)			
1.3.3	Is distance between handrails and any obstruction min. 75 mm?	NORSOK C-002, 5.8	Requirement satisfied			
1.3.4	Are stairways, stepladders and inclined ladders provided with continuous railing on both sides, from the top to the lower level and safely terminated at both ends?	NORSOK S-002, 5.1.2 NORSOK C-002, 5.8	Requirement satisfied			
1.3.5	Is diameter of handrails within the range 25–50mm or in compliance with NORSOK C-002?	NORSOK S-002, 5.1.2. NORSK C-002 EN 12437	Requirement satisfied (about 48.3 mm) (applicable to all platform)			

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.4	**STAIRS**					
1.4.1	Are stairs or ladders provided where there is a change of elevation exceeding 200 mm and access is required? In case this is not comply what is the mitigation measure proposed?	DEP SHELL	The stairs giving access to the TP entrance door are already in place. The stairs have been verified and the accesses are consistent with the standard applied.			
1.4.2	Are stairs provided where daily access is required?	NORSOK S-002, 5.1.2	Requirement not applicable			
1.4.3	Is width of stairway passage min. 1000 mm, as measured between the inside of handrails (or min. 1200 mm for access to more than two levels) or in compliance with NORSOK C-002?	NORSOK C-002, 5.2	Requirement satisfied (for TP, refer to recommendation #1)			
1.4.4	Is the inclination of stairways within the range 21° - 45° ? (Recommended range 30° - 38°)	NORSOK S-002, Annex B	Requirement satisfied (30°) (applicable to all platform)			
1.4.5	Are the following requirements for steps met: a) Height riser (h) ≤ 250 mm b) Going (g) ≥ 100 mm c) 600 mm ≤ g+2h ≤ 660 mm	EN 12437	Requirement satisfied (applicable to all platform)			
1.5	**LADDERS AND STEPLADDERS**					
1.5.1	Is the inclination of: - fixed ladders within the range 76° - 90° ? - fixed stepladders within the range 46° - 75° ?	NORSOK S-002, Annex B	Requirement satisfied			
1.5.2	Is the width between upright bearers at least 400 mm?	NORSOK S-002, Annex B	Requirement satisfied			
1.5.3	Is there a horizontal clearance of 650 mm in front of ladders, and a horizontal clearance of 200 mm behind the front of the rungs (150 mm for discontinuous obstacles)?	NORSOK S-002, Annex B	Requirement satisfied (for TP, refer to recommendation #1)			

HFE CHECKLIST - ACCESS						
	REQUIREMENT	**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.5.4	Are rungs evenly spaced, with vertical spacing min. 250 mm and max 300 mm.	NORSOK S-002, Annex B	Requirement satisfied			
1.5.5	Are rungs provided with a non-slip surface?	NORSOK S-002, Annex B	Rungs have a square shape, that prevent slipping off the end of the rungs, but the surface is not classified non-slip surface.	Consider to provide non-slip surface to the rungs of vertical ladders	1	Rosetti - Structural

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.5.6	Are safety cages, starting at height 2200 - 3000 mm, provided for ladders higher than 3000 mm?	NORSOK S-002, Annex B	Requirement satisfied			
1.5.7	Is there a rest landing arranged at each 6000 mm for ladders above 10,000 mm?	NORSOK S-002, Annex B	Requirement not applicable (no height higher than 8 meters is foreseen)			
1.6	**GATES**					
1.6.1	Are self-closing gates arranged at the top of ladders	NORSOK S-002, 5.1.2	Requirement satisfied for gate inside the TP			
1.7	**HATCHES AND MANWAYS**					
1.7.1	Do hatches provided have an access opening of min. 800x800 mm (min. 600x600 mm for access to cofferdams and tanks from floor/platform)?	NORSOK S-002, Annex B	Requirement not applicable			
1.7.2	Are access openings in vertical partitions into cofferdams, tanks etc. equipped with hand grips on both sides above the opening ?	NORSOK S-002, 5.1.2	Requirement not applicable			
1.7.3	Are inspection hatches side hinged ?	NORSOK S-002, 5.2.1.2	Requirement satisfied (TP ingress)			

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.7.4	Are openings in deck larger than 100x100 mm secured by guard-rail or similar?	NORSOK S-002, Annex B	The requirement has been considered for the pipe / instrument floor penetration. These openings do not represent a hazard for the operators (openings usually less than 100x100 mm and toe boards applied for protection if necessary).			
1.8	**DOORS**					
1.8.1	Do doors have a clear opening of at least 750 mm width and 2050 mm height?	NORSOK S-002, 6.1	Requirement not applicable			

HFE CHECKLIST - SAFETY PRINCIPLES AND ARRANGEMENTS

	REQUIREMENT	REF.	COMMENTS	RECOMMENDATIONS	REF.	BY
2.1	**Storage of dangerous goods**					
1.1.1	Areas for storage of flammable, radioactive, explosive or otherwise hazardous substances should be marked with appropriate warning signboards.	DNVGL-OS-A101	Requirement not applicable			
1.1.2	Flammable liquids which give off dangerous vapours and flammable gases shall be stored in a well ventilated space or on deck.	DNVGL-OS-A101	Requirement not applicable			
2.2	**Cranes and lay down areas**					
2.2.1	Cranes and lay down areas shall be located so as to minimise the risk of load handling or dropped object damage to systems and structures.	DNVGL-OS-A101	Requirement not applicable			
2.2.2	The need for load handling above pressurised hydrocarbon equipment, hazardous inventories, and equipment important for safety should be avoided as far as possible. Suitable impact protection should be provided where such lifting cannot be avoided.	DNVGL-OS-A101	Requirement not applicable			
2.2.3	Lay down areas should be provided with heavy-duty barriers to prevent damage to adjacent equipment.	DNVGL-OS-A101	Requirement not applicable			
2.2.4	Lay down areas should be located outside hazardous areas.	DNVGL-OS-A101	Requirement not applicable			
2.3	**Railings and barriers**					
2.3.1	The guard rails shall have at least three courses so arranged that the lowest rail is not more than 230 mm above the deck or toe board and the highest rail not less than 1 m above the deck.	DNVGL-OS-A101	Requirement satisfied			
2.3.2	Every deck, gangway, stairway and opening from which an object could drop more than 2 m, shall, where practicable, be provided with a toe board of not less than 150 mm height.	DNVGL-OS-A101	Requirement satisfied (applicable to all platform)			
2.4	**General principles for Hazardous area (with potential for release of flammable / comburent gas, vapours or liquids during normal operation)**					
2.4.1	Location of a continuous source within an enclosed area, or in open areas with significant obstructions to ventilation, shall be avoided.	DNVGL-OS-A101 Best practice	Requirement not applicable			
2.6	**Escape routes**					

HFE CHECKLIST - SAFETY PRINCIPLES AND ARRANGEMENTS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
2.6.1	Safe, direct and unobstructed (not be blocked by portable equipment, supplies or piping/valves) exits, access, and escape routes shall be provided from all regularly manned areas of the mobile unit or offshore installation to temporary refuge, muster areas and embarkation or evacuation points.	DNVGL-OS-A101	Acceptable technical deviation considering the access to TP since is not normally manned area			
2.6.2	All areas shall be provided with at least two exits and at least secondary escape routes, such that at least one exit and the connected escape route will be passable during an accidental event. Dead-ends are allow for a maximum of 5m.	DNVGL-OS-A101	Acceptable technical deviation considering the access to TP since is not normally manned area			
2.7	**Muster areas**					
2.7.1	Easily accessible muster areas shall be clearly defined on the offshore installation. All muster areas shall be located with direct and ready access to the escape mean or other life-saving appliances.	DNVGL-OS-A101	Requirement partially satisfied (presence of safety cabinet and other life saving appliances, see 123A90-DDL-SAF-DL-30025)	Verify the type and position of stair for transition piece entrance in order to avoid possible interference with primary muster point.	2	Rosetti - Structural & Safety
2.7.2	Each muster station shall have sufficient space to accommodate all persons assigned to muster at that station, but at least 0.35 m2 per person.	DNVGL-OS-A101	Requirement satisfied (primary muster point: 8 m2 for 10 people)			
2.8	**Emergency lighting**					
2.8.1	All regularly manned areas on the mobile unit or offshore installation shall be equipped with emergency lighting, which is supplied from the emergency source of power. The illumination level shall be sufficient to ensure that necessary emergency response actions, including reading of signs and layouts, can take place efficiently.	DNVGL-OS-A101	Requirement satisfied (note that maintenance activities is foreseen only during daytime)			
2.8.2	Escape routes, access routes and exit points shall be illuminated so they are readily identifiable in an emergency.	DNVGL-OS-A101	Requirement satisfied (note that maintenance activities is foreseen only during daytime)			

HFE CHECKLIST - SAFETY PRINCIPLES AND ARRANGEMENTS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
2.9	**Marking and warning signboards**					
2.9.1	Signs and marking should show exit points and the direction to muster areas, embarkation areas and means of escape to sea.	DNVGL-OS-A101	Requirement satisfied (signs and marking for muster point and escape route will be part of a dedicate layout, in progress).			
2.10	**Communications and alarms**					
2.10.1	Communication and alarm systems shall be provided to alert all personnel on board, at any location, of an emergency. The systems shall be suitable to provide instructions for emergency response.	DNVGL-OS-A101	Requirement satisfied (sounders will be installed in all level of platform).			

HFE CHECKLIST - ERGONOMICS						
	REQUIREMENT	**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
3.1	Is the height of table top for seated work within the range 680-750 mm, and easily adjustable from work position?	NORSOK S-002, Annex B	Requirement not applicable.			
3.2	Is the height of table top for standing work within the range 800-1050 mm, and easily adjustable from work position? NORSOK S-002, Annex B	NORSOK S-002, Annex B	Requirement not applicable.			
3,3	Is it possible to operate handles and push buttons with gloves on?	NORSOK S-002, Annex B	Requirement satisfied.			

HFE CHECKLIST - SAFETY PRECAUTIONS

	REQUIREMENT	REF.	COMMENTS	RECOMMENDATIONS	REF.	BY
4.1	Are anti-skid surfaces provided in access ways and work areas? (The surfaces of decks, walkways, platforms, stairs and ladder rungs etc. shall be non-slip, and designed for drainage and easy cleaning of contaminants like mud and oil, where relevant)	EN 292-1, 4.2 NORSOK S-002, 5.1.2 DNVGL-OS-A101	Requirement satisfied for escape route and muster point.			
4.2	Is protection against personnel contact with hot surfaces above 70°C and cold surfaces below -10°C provided?	NORSOK S-002, 5.3.2 EN 292-1, 4.4	Requirement not applicable.(applicable to all platform)			
4.3	Are dead end corridors and platforms exceeding 5 m length provided with min. 2 exits?	NORSOK S-DP-001, 7.2	Requirement not applicable			
4.4	Are safe distances between possible moving objects exceeding the following minimum gaps to avoid crushing of the body parts at risk: • Body > 500 mm • Head > 300 mm • Leg > 180 mm • Foot > 120 mm • Toe > 50 mm • Arm > 120 mm • Hand > 100 mm • Finger > 25 mm	NORSOK S-002 EN 349	Requirement not applicable			

HFE CHECKLIST - HAZARDOUS SUBSTANCES						
	REQUIREMENT	**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
5.1	Are Safety Data Sheets, approved according to applicable regulation for all chemicals delivered or instructed to be used with the machinery?	NORSOK S-002, 5.4.2 NS-EN 626-1	Requirement not applicable			
5.2	Are none of the prohibited substances included in the machinery's chemical inventory?	NORSOK S-002, 5.4.2 and Annex D.1	Requirement not applicable			
5.3	Are drip trays provided under all sampling / filling points and other places where spillage might occur?	NORSOK S-002, 5.4.1 NORSOK S-DP-003	Requirement not applicable			
5.5	Are emissions from machinery controlled and in compliance with legislation / NORSOK requirements regarding threshold limit values?	NORSOK S-002, 5.4.3 NS-EN 626-1	Requirement not applicable			

HFE CHECKLIST - ACCESS

	REQUIREMENT	REF.	COMMENTS	RECOMMENDATIONS	REF.	BY
1.1	**HORIZONTAL / VERTICAL DISTANCES**					
1.1.1	Are horizontal workspaces for fixed equipment minimum 700 mm?	NORSOK S-002, Annex B	Position of the pumps and related piping is not yet defined.	Ensure adequate space for maintenance activities of water pumps in the final position.	3	Rosetti - Piping
1.1.2	Are centre heights of control devices for standing operations (including valve handles) max. 1800 mm above base ? Are the centre heights of control devices for normal operation controls and for controls where access in an emergency is required 900-1500 mm above base?	NORSOK S-002, Annex B	Requirement satisfied			
1.1.3	Are visual displays located 1100-2000 mm above floor level?	NORSOK S-002, Annex B	Requirement not applicable (no visual displays are provided)			
1.1.4	Is space between fixed cabinets and floor min. 250 mm (or preferably fixed on floor without space underneath)?	NORSOK S-002, Annex B	Requirement not applicable (not fixed cabinets are foreseen outside cabinets)			
1.1.5	Are access ways to permanently and intermittently manned workplaces: - when technically practicable, min. 900 mm wide ? - In any case min 800 mm wide ?	NORSOK S-002, Annex B	Requirement satisfied (wide area where equipment are installed)			
1.1.6	Are vertical clearances in access ways min. 2100 mm? Are vertical clearances in primary/secondary escape route min. 2300 mm?	NORSOK S-002, Annex B	Requirement satisfied (primary escape route >2300 mm, escape route from WTP >3000mm)			
1.1.7	Are vertical clearances in work areas and stairs min. 2300 mm?	NORSOK S-002, Annex B NORSOK C-002, 5.7	Requirement satisfied			
1.2	**PIPES AND FLANGES**					
1.2.1	Are spaces between pipe bottoms and floor min. 150 mm?	NORSOK S-002, Annex B	Requirement satisfied			

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.2.2	Are spaces between external diameter of flanges and fixed obstructions min. 250 mm?.	NORSOK S-002, Annex B	BL of WTP piping not finalized at the present project stage	Ensure adequate space for maintenance activities for flanges/ valves near the WTP	4	Rosetti - Piping
1.3	**GUARDRAILS**					
1.3.1	Are guardrails provided on elevations higher than 500 mm?	NORSOK S-002, Annex B	Requirement not applicable.			
1.3.2	Is height from floor to top of the guardrail min. 1100 mm?	NORSOK S-002, 5.1.2	Requirement satisfied (1100 mm)			
1.3.3	Is distance between handrails and any obstruction min. 75 mm?	NORSOK C-002, 5.8	Requirement satisfied			
1.3.4	Are stairways, stepladders and inclined ladders provided with continuous railing on both sides, from the top to the lower level and safely terminated at both ends?	NORSOK S-002, 5.1.2 NORSOK C-002, 5.8	Requirement satisfied (applicable to all platform)			
1.3.5	Is diameter of handrails within the range 25–50mm or in compliance with NORSOK C-002?	NORSOK S-002, 5.1.2. NORSK C-002 EN 12437	Requirement satisfied (about 48.3 mm) (applicable to all platform)			

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.4	**STAIRS**					
1.4.1	Are stairs or ladders provided where there is a change of elevation exceeding 200 mm and access is required? In case this is not comply what is the mitigation measure proposed?	DEP SHELL	Requirement satisfied CPI BESS contaniners has elevation about 600 mm. Portable ladders will be			
1.4.2	Are stairs provided where daily access is required?	NORSOK S-002, 5.1.2	Requirement not applicable			
1.4.3	Is width of stairway passage min. 1000 mm, as measured between the inside of handrails (or min. 1200 mm for access to more than two levels) or in compliance with NORSOK C-002?	NORSOK C-002, 5.2	Requirement satisfied			
1.4.4	Is the inclination of stairways within the range 21° - 45° ? (Recommended range 30° - 38°)	NORSOK S-002, Annex B	Requirement satisfied (30°) (applicable to all platform)			
1.4.5	Are the following requirements for steps met: a) Height riser (h) ≤ 250 mm b) Going (g) ≥ 100 mm c) 600 mm ≤ g+2h ≤ 660 mm	EN 12437	Requirement satisfied (applicable to all platform)			
1.5	**LADDERS AND STEPLADDERS**					
1.5.1	Is the inclination of: - fixed ladders within the range 76° - 90° ? - fixed stepladders within the range 46° - 75° ?	NORSOK S-002, Annex B	Requirement satisfied			
1.5.2	Is the width between upright bearers at least 400 mm?	NORSOK S-002, Annex B	Requirement satisfied			
1.5.3	Is there a horizontal clearance of 650 mm in front of ladders, and a horizontal clearance of 200 mm behind the front of the rungs (150 mm for discontinuous obstacles)?	NORSOK S-002, Annex B	Requirement not applicable			
1.5.4	Are rungs evenly spaced, with vertical spacing min. 250 mm and max 300 mm.	NORSOK S-002, Annex B	Requirement satisfied			

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.5.5	Are rungs provided with a non-slip surface?	NORSOK S-002, Annex B	Rungs have a square shape, that prevent slipping off the end of the rungs, but the surface is not classified non-slip surface	Consider to provide non-slip surface to the rungs of vertical ladders	1	Rosetti - Structural

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.5.6	Are safety cages, starting at height 2200 - 3000 mm, provided for ladders higher than 3000 mm?	NORSOK S-002, Annex B	Requirement not applicable			
1.5.7	Is there a rest landing arranged at each 6000 mm for ladders above 10,000 mm?	NORSOK S-002, Annex B	Requirement not applicable			
1.6	**GATES**					
1.6.1	Are self-closing gates arranged at the top of ladders	NORSOK S-002, 5.1.2	Requirement not applicable			
1.7	**HATCHES AND MANWAYS**					
1.7.1	Do hatches provided have an access opening of min. 800x800 mm (min. 600x600 mm for access to cofferdams and tanks from floor/platform)?	NORSOK S-002, Annex B	Requirement satisfied (presence of hatch between lower deck an TP, with opening of 800 mm). Piping above this hatch will be deleted (wrong representation). Not information available (man hatches is foreseen for N2 tank). No nornmal maintenance activities involving N2 hatches is expected.			
1.7.2	Are access openings in vertical partitions into cofferdams, tanks etc. equipped with hand grips on both sides above the opening ?	NORSOK S-002, 5.1.2	At the moment, the access is not yet defined in the 3D model	Ensure that the access will be equipped with vertical ladder to reach equipment on top of TP.	5	Rosetti - Structural

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.7.3	Are inspection hatches side hinged ?	NORSOK S-002, 5.2.1.2	Acceptable technical deviation considering the access between lower deck and TP since is not normally manned area.			
1.7.4	Are openings in deck larger than 100x100 mm secured by guard-rail or similar?	NORSOK S-002, Annex B	At the moment, the access is not yet defined in the 3D model. There will be procedure to manage the opening the inspection hatches between lower deck and TP (PTW). The requirement has been considered also for the pipe / instrument floor penetration. These openings do not represent a hazard for the operators (openings usually less than 100x100 mm and toe boards applied for protection if necessary).			
1.8	**DOORS**					
1.8.1	Do doors have a clear opening of at least 750 mm width and 2050 mm height?	NORSOK S-002, 6.1	Requirement not applicable			

HFE CHECKLIST - SAFETY PRINCIPLES AND ARRANGEMENTS

	REQUIREMENT	REF.	COMMENTS	RECOMMENDATIONS	REF.	BY
2.1	**Storage of dangerous goods**					
1.1.1	Areas for storage of flammable, radioactive, explosive or otherwise hazardous substances should be marked with appropriate warning signboards.	DNVGL-OS-A101	Requirement not applicable			
1.1.2	Flammable liquids which give off dangerous vapours and flammable gases shall be stored in a well ventilated space or on deck.	DNVGL-OS-A101	Requirement not applicable			
2.2	**Cranes and lay down areas**					
2.2.1	Cranes and lay down areas shall be located so as to minimise the risk of load handling or dropped object damage to systems and structures.	DNVGL-OS-A101	Requirement not applicable			
2.2.2	The need for load handling above pressurised hydrocarbon equipment, hazardous inventories, and equipment important for safety should be avoided as far as possible. Suitable impact protection should be provided where such lifting cannot be avoided.	DNVGL-OS-A101	Requirement not applicable			
2.2.3	Lay down areas should be provided with heavy-duty barriers to prevent damage to adjacent equipment.	DNVGL-OS-A101	Requirement not applicable			
2.2.4	Lay down areas should be located outside hazardous areas.	DNVGL-OS-A101	Requirement not applicable			
2.3	**Railings and barriers**					
2.3.1	The guard rails shall have at least three courses so arranged that the lowest rail is not more than 230 mm above the deck or toe board and the highest rail not less than 1 m above the deck.	DNVGL-OS-A101	Requirement satisfied			
2.3.2	Every deck, gangway, stairway and opening from which an object could drop more than 2 m, shall, where practicable, be provided with a toe board of not less than 150 mm height.	DNVGL-OS-A101	Requirement satisfied (applicable to all platform)			
2.4	**General principles for Hazardous area (with potential for release of flammable / comburent gas, vapours or liquids during normal operation)**					
2.4.1	Location of a continuous source within an enclosed area, or in open areas with significant obstructions to ventilation, shall be avoided.	DNVGL-OS-A101 Best practice	Requirement not applicable. No hazardous areas are present in the lower deck.			
2.6	**Escape routes**					

HFE CHECKLIST - SAFETY PRINCIPLES AND ARRANGEMENTS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
2.6.1	Safe, direct and unobstructed (not be blocked by portable equipment, supplies or piping/valves) exits, access, and escape routes shall be provided from all regularly manned areas of the mobile unit or offshore installation to temporary refuge, muster areas and embarkation or evacuation points.	DNVGL-OS-A101	Requirement satisfied. Presence of two stairs in opposite location for secondary muster area (upper deck) and one stair to interface level to primary muster point.			
2.6.2	All areas shall be provided with at least two exits and at least secondary escape routes, such that at least one exit and the connected escape route will be passable during an accidental event. Dead-ends are allow for a maximum of 5m.	DNVGL-OS-A101	Requirement satisfied. Presence of two stairs in opposite location for secondary muster area (upper deck) and one stair to interface level to primary muster point.			
2.7	**Muster areas**					
2.7.1	Easily accessible muster areas shall be clearly defined on the offshore installation. All muster areas shall be located with direct and ready access to the escape mean or other life-saving appliances.	DNVGL-OS-A101	Requirement satisfied (presence of safety cabinet and other life saving appliances, see 123A90-DDL-SAF-DL-30025)			
2.7.2	Each muster station shall have sufficient space to accommodate all persons assigned to muster at that station, but at least 0.35 m2 per person.	DNVGL-OS-A101	Requirement satisfied (primary muster point: 8 m2 for 10 people)			
2.8	**Emergency lighting**					
2.8.1	All regularly manned areas on the mobile unit or offshore installation shall be equipped with emergency lighting, which is supplied from the emergency source of power. The illumination level shall be sufficient to ensure that necessary emergency response actions, including reading of signs and layouts, can take place efficiently.	DNVGL-OS-A101	Requirement satisfied (note that maintenance activities is foreseen only during daytime)			

HFE CHECKLIST - SAFETY PRINCIPLES AND ARRANGEMENTS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
2.8.2	Escape routes, access routes and exit points shall be illuminated so they are readily identifiable in an emergency.	DNVGL-OS-A101	Requirement satisfied (note that maintenance activities is foreseen only during daytime)			
2.9	**Marking and warning signboards**					
2.9.1	Signs and marking should show exit points and the direction to muster areas, embarkation areas and means of escape to sea.	DNVGL-OS-A101	Requirement satisfied (signs and marking for muster point and escape route will be part of a dedicate layout, in progress).			
2.10	**Communications and alarms**					
2.10.1	Communication and alarm systems shall be provided to alert all personnel on board, at any location, of an emergency. The systems shall be suitable to provide instructions for emergency response.	DNVGL-OS-A101	Requirement satisfied (sounders will be installed in all level of platform).			

HFE CHECKLIST - ERGONOMICS						
	REQUIREMENT	**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
3.1	Is the height of table top for seated work within the range 680-750 mm, and easily adjustable from work position?	NORSOK S-002, Annex B	Requirement not applicable.			
3.2	Is the height of table top for standing work within the range 800-1050 mm, and easily adjustable from work position? NORSOK S-002, Annex B	NORSOK S-002, Annex B	Requirement not applicable.			
3,3	Is it possible to operate handles and push buttons with gloves on?	NORSOK S-002, Annex B	Requirement satisfied.			

HFE CHECKLIST - SAFETY PRECAUTIONS						
	REQUIREMENT	**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
4.1	Are anti-skid surfaces provided in access ways and work areas? (The surfaces of decks, walkways, platforms, stairs and ladder rungs etc. shall be non-slip, and designed for drainage and easy cleaning of contaminants like mud and oil, where relevant)	EN 292-1, 4.2 NORSOK S-002, 5.1.2 DNVGL-OS-A101	Requirement satisfied for escape route and muster point.			
4.2	Is protection against personnel contact with hot surfaces above 70°C and cold surfaces below -10°C provided?	NORSOK S-002, 5.3.2 EN 292-1, 4.4	Requirement not applicable.			
4.3	Are dead end corridors and platforms exceeding 5 m length provided with min. 2 exits?	NORSOK S-DP-001, 7.2	Requirement not applicable			
4.4	Are safe distances between possible moving objects exceeding the following minimum gaps to avoid crushing of the body parts at risk: • Body > 500 mm • Head > 300 mm • Leg > 180 mm • Foot > 120 mm • Toe > 50 mm • Arm > 120 mm • Hand > 100 mm • Finger > 25 mm	NORSOK S-002 EN 349	Maintenance on pump is expected, but the moving parts will be protected as for technical standards. In case of removing of protection, activities will be manage with PTW.			

HFE CHECKLIST - HAZARDOUS SUBSTANCES						
	REQUIREMENT	**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
5.1	Are Safety Data Sheets, approved according to applicable regulation for all chemicals delivered or instructed to be used with the machinery?	NORSOK S-002, 5.4.2 NS-EN 626-1	Requirement satisfied. Each substance will be proviede with Safety Data Sheets			
5.2	Are none of the prohibited substances included in the machinery's chemical inventory?	NORSOK S-002, 5.4.2 and Annex D.1	Requirement not applicable			
5.3	Are drip trays provided under all sampling / filling points and other places where spillage might occur?	NORSOK S-002, 5.4.1 NORSOK S-DP-003	Drip trays are not provided under biocide sampling point, but deck is plated. The risk to spillage in the sea is negligible.	Rosetti to investigate if sample collection is needed to check biocide concentration	6	Rosetti -Process
5.5	Are emissions from machinery controlled and in compliance with legislation / NORSOK requirements regarding threshold limit values?	NORSOK S-002, 5.4.3 NS-EN 626-1	Requirement not applicable			

HFE CHECKLIST - ACCESS

	REQUIREMENT	REF.	COMMENTS	RECOMMENDATIONS	REF.	BY
1.1	**HORIZONTAL / VERTICAL DISTANCES**					
1.1.1	Are horizontal workspaces for fixed equipment minimum 700 mm?	NORSOK S-002, Annex B	Requirement satisfied			
1.1.2	Are centre heights of control devices for standing operations (including valve handles) max. 1800 mm above base ? Are the centre heights of control devices for normal operation controls and for controls where access in an emergency is required 900-1500 mm above base?	NORSOK S-002, Annex B	Requirement partially satisfied (all cabinets are installed > 1800 mm).	Rosetti to provide portable step ladders in case of operation in the top of cabinets.	7	Rosetti - Architectural
1.1.3	Are visual displays located 1100-2000 mm above floor level?	NORSOK S-002, Annex B	Requirement satisfied			
1.1.4	Is space between fixed cabinets and floor min. 250 mm (or preferably fixed on floor without space underneath)?	NORSOK S-002, Annex B	Requirement satisfied			
1.1.5	Are access ways to permanently and intermittently manned workplaces: - when technically practicable, min. 900 mm wide ? - In any case min 800 mm wide ?	NORSOK S-002, Annex B	Requirement satisfied (800 mm entrance door)			
1.1.6	Are vertical clearances in access ways min. 2100 mm? Are vertical clearances in primary/secondary escape route min. 2300 mm?	NORSOK S-002, Annex B	Requirement satisfied (container height is generally >4000mm; door height 2800mm)			
1.1.7	Are vertical clearances in work areas and stairs min. 2300 mm?	NORSOK S-002, Annex B NORSOK C-002, 5.7	Requirement satisfied			
1.2	**PIPES AND FLANGES**					
1.2.1	Are spaces between pipe bottoms and floor min. 150 mm?	NORSOK S-002, Annex B	Requirement not applicable.			
1.2.2	Are spaces between external diameter of flanges and fixed obstructions min. 250 mm?.	NORSOK S-002, Annex B	Requirement not applicable.			
1.3	**GUARDRAILS**					
1.3.1	Are guardrails provided on elevations higher than 500 mm?	NORSOK S-002, Annex B	Requirement not applicable.			
1.3.2	Is height from floor to top of the guardrail min. 1100 mm?	NORSOK S-002, 5.1.2	Requirement not applicable.			

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.3.3	Is distance between handrails and any obstruction min. 75 mm?	NORSOK C-002, 5.8	Requirement not applicable.			
1.3.4	Are stairways, stepladders and inclined ladders provided with continuous railing on both sides, from the top to the lower level and safely terminated at both ends?	NORSOK S-002, 5.1.2 NORSOK C-002, 5.8	Requirement not applicable.			
1.3.5	Is diameter of handrails within the range 25–50mm or in compliance with NORSOK C-002?	NORSOK S-002, 5.1.2. NORSK C-002 EN 12437	Requirement not applicable.			

HFE CHECKLIST - ACCESS

	REQUIREMENT	REF.	COMMENTS	RECOMMENDATIONS	REF.	BY
1.4	**STAIRS**					
1.4.1	Are stairs or ladders provided where there is a change of elevation exceeding 200 mm and access is required? In case this is not comply what is the mitigation measure proposed?	DEP SHELL	Requirement satisfied CPI BESS containers has elevation about 600 mm. Portable ladders will be provided for access.			
1.4.2	Are stairs provided where daily access is required?	NORSOK S-002, 5.1.2	Requirement not applicable			
1.4.3	Is width of stairway passage min. 1000 mm, as measured between the inside of handrails (or min. 1200 mm for access to more than two levels) or in compliance with NORSOK C-002?	NORSOK C-002, 5.2	Requirement not applicable.			
1.4.4	Is the inclination of stairways within the range 21° - 45° ? (Recommended range 30° - 38°)	NORSOK S-002, Annex B	Requirement not applicable.			
1.4.5	Are the following requirements for steps met: a) Height riser (h) ≤ 250 mm b) Going (g) ≥ 100 mm c) 600 mm ≤ g+2h ≤ 660 mm	EN 12437	Requirement not applicable.			
1.5	**LADDERS AND STEPLADDERS**					
1.5.1	Is the inclination of: - fixed ladders within the range 76° - 90° ? - fixed stepladders within the range 46° - 75° ?	NORSOK S-002, Annex B	Requirement not applicable.			
1.5.2	Is the width between upright bearers at least 400 mm?	NORSOK S-002, Annex B	Requirement not applicable.			
1.5.3	Is there a horizontal clearance of 650 mm in front of ladders, and a horizontal clearance of 200 mm behind the front of the rungs (150 mm for discontinuous obstacles)?	NORSOK S-002, Annex B	Requirement not applicable			
1.5.4	Are rungs evenly spaced, with vertical spacing min. 250 mm and max 300 mm.	NORSOK S-002, Annex B	Requirement not applicable.			
1.5.5	Are rungs provided with a non-slip surface?	NORSOK S-002, Annex B	Requirement not applicable.			

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.5.6	Are safety cages, starting at height 2200 - 3000 mm, provided for ladders higher than 3000 mm?	NORSOK S-002, Annex B	Requirement not applicable			
1.5.7	Is there a rest landing arranged at each 6000 mm for ladders above 10,000 mm?	NORSOK S-002, Annex B	Requirement not applicable			
1.6	**GATES**					
1.6.1	Are self-closing gates arranged at the top of ladders	NORSOK S-002, 5.1.2	Requirement not applicable			
1.7	**HATCHES AND MANWAYS**					
1.7.1	Do hatches provided have an access opening of min. 800x800 mm (min. 600x600 mm for access to cofferdams and tanks from floor/platform)?	NORSOK S-002, Annex B	Requirement not applicable			
1.7.2	Are access openings in vertical partitions into cofferdams, tanks etc. equipped with hand grips on both sides above the opening ?	NORSOK S-002, 5.1.2	Requirement not applicable			
1.7.3	Are inspection hatches side hinged ?	NORSOK S-002, 5.2.1.2	Requirement not applicable			
1.7.4	Are openings in deck larger than 100x100 mm secured by guard-rail or similar?	NORSOK S-002, Annex B	In the area there are not openings in deck which may present a risk for the operators.			
1.8	**DOORS**					
1.8.1	Do doors have a clear opening of at least 750 mm width and 2050 mm height?	NORSOK S-002, 6.1	Requirement satisfied			

HFE CHECKLIST - SAFETY PRINCIPLES AND ARRANGEMENTS

	REQUIREMENT	REF.	COMMENTS	RECOMMENDATIONS	REF.	BY
2.1	**Storage of dangerous goods**					
1.1.1	Areas for storage of flammable, radioactive, explosive or otherwise hazardous substances should be marked with appropriate warning signboards.	DNVGL-OS-A101	Requirement not applicable			
1.1.2	Flammable liquids which give off dangerous vapours and flammable gases shall be stored in a well ventilated space or on deck.	DNVGL-OS-A101	Requirement not applicable			
2.2	**Cranes and lay down areas**					
2.2.1	Cranes and lay down areas shall be located so as to minimise the risk of load handling or dropped object damage to systems and structures.	DNVGL-OS-A101	Requirement not applicable			
2.2.2	The need for load handling above pressurised hydrocarbon equipment, hazardous inventories, and equipment important for safety should be avoided as far as possible. Suitable impact protection should be provided where such lifting cannot be avoided.	DNVGL-OS-A101	Requirement not applicable			
2.2.3	Lay down areas should be provided with heavy-duty barriers to prevent damage to adjacent equipment.	DNVGL-OS-A101	Requirement not applicable			
2.2.4	Lay down areas should be located outside hazardous areas.	DNVGL-OS-A101	Requirement not applicable			
2.3	**Railings and barriers**					
2.3.1	The guard rails shall have at least three courses so arranged that the lowest rail is not more than 230 mm above the deck or toe board and the highest rail not less than 1 m above the deck.	DNVGL-OS-A101	Requirement not applicable			
2.3.2	Every deck, gangway, stairway and opening from which an object could drop more than 2 m, shall, where practicable, be provided with a toe board of not less than 150 mm height.	DNVGL-OS-A101	Requirement not applicable			
2.4	**General principles for Hazardous area (with potential for release of flammable / comburent gas, vapours or liquids during normal operation)**					
2.4.1	Location of a continuous source within an enclosed area, or in open areas with significant obstructions to ventilation, shall be avoided.	DNVGL-OS-A101 Best practice	Requirement not applicable. No hazardous areas are present in the containers.			
2.6	**Escape routes**					

HFE CHECKLIST - SAFETY PRINCIPLES AND ARRANGEMENTS

	REQUIREMENT	REF.	COMMENTS	RECOMMENDATIONS	REF.	BY
2.6.1	Safe, direct and unobstructed (not be blocked by portable equipment, supplies or piping/valves) exits, access, and escape routes shall be provided from all regularly manned areas of the mobile unit or offshore installation to temporary refuge, muster areas and embarkation or evacuation points.	DNVGL-OS-A101	Requirement satisfied. Presence of two escape routes for each container.			
2.6.2	All areas shall be provided with at least two exits and at least secondary escape routes, such that at least one exit and the connected escape route will be passable during an accidental event. Dead-ends are allow for a maximum of 5m.	DNVGL-OS-A101	Requirement satisfied. Presence of two escape routes for each container.			
2.7	**Muster areas**					
2.7.1	Easily accessible muster areas shall be clearly defined on the offshore installation. All muster areas shall be located with direct and ready access to the escape mean or other life-saving appliances.	DNVGL-OS-A101	Requirement not applicable.			
2.7.2	Each muster station shall have sufficient space to accommodate all persons assigned to muster at that station, but at least 0.35 m2 per person.	DNVGL-OS-A101	Requirement satisfied (primary muster point: 8 m2 for 10 people)			
2.8	**Emergency lighting**					
2.8.1	All regularly manned areas on the mobile unit or offshore installation shall be equipped with emergency lighting, which is supplied from the emergency source of power. The illumination level shall be sufficient to ensure that necessary emergency response actions, including reading of signs and layouts, can take place efficiently.	DNVGL-OS-A101	Requirement satisfied (cabinets are provided with emergency lighting)			
2.8.2	Escape routes, access routes and exit points shall be illuminated so they are readily identifiable in an emergency.	DNVGL-OS-A101	Requirement satisfied (cabinets are provided with emergency lighting)			
2.9	**Marking and warning signboards**					

HFE CHECKLIST - SAFETY PRINCIPLES AND ARRANGEMENTS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
2.9.1	Signs and marking should show exit points and the direction to muster areas, embarkation areas and means of escape to sea.	DNVGL-OS-A101	Requirement satisfied (signs and marking for muster point and escape route will be part of a dedicate layout, in progress).			
2.10	**Communications and alarms**					
2.10.1	Communication and alarm systems shall be provided to alert all personnel on board, at any location, of an emergency. The systems shall be suitable to provide instructions for emergency response.	DNVGL-OS-A101	Requirement satisfied (sounders will be installed in all level of platform).			

HFE CHECKLIST - ERGONOMICS						
	REQUIREMENT	**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
3.1	Is the height of table top for seated work within the range 680-750 mm, and easily adjustable from work position?	NORSOK S-002, Annex B	Requirement not applicable.			
3.2	Is the height of table top for standing work within the range 800-1050 mm, and easily adjustable from work position? NORSOK S-002, Annex B	NORSOK S-002, Annex B	Requirement not applicable.			
3,3	Is it possible to operate handles and push buttons with gloves on?	NORSOK S-002, Annex B	Requirement satisfied.			

HFE CHECKLIST - SAFETY PRECAUTIONS

	REQUIREMENT	REF.	COMMENTS	RECOMMENDATIONS	REF.	BY
4.1	Are anti-skid surfaces provided in access ways and work areas? (The surfaces of decks, walkways, platforms, stairs and ladder rungs etc. shall be non-slip, and designed for drainage and easy cleaning of contaminants like mud and oil, where relevant)	EN 292-1, 4.2 NORSOK S-002, 5.1.2 DNVGL-OS-A101	Requirement satisfied for escape route and muster point.			
4.2	Is protection against personnel contact with hot surfaces above 70°C and cold surfaces below -10°C provided?	NORSOK S-002, 5.3.2 EN 292-1, 4.4	Requirement not applicable.			
4.3	Are dead end corridors and platforms exceeding 5 m length provided with min. 2 exits?	NORSOK S-DP-001, 7.2	Requirement satisied.			
4.4	Are safe distances between possible moving objects exceeding the following minimum gaps to avoid crushing of the body parts at risk: • Body > 500 mm • Head > 300 mm • Leg > 180 mm • Foot > 120 mm • Toe > 50 mm • Arm > 120 mm • Hand > 100 mm • Finger > 25 mm	NORSOK S-002 EN 349	Requirement not applicable			

HFE CHECKLIST - HAZARDOUS SUBSTANCES						
	REQUIREMENT	**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
5.1	Are Safety Data Sheets, approved according to applicable regulation for all chemicals delivered or instructed to be used with the machinery?	NORSOK S-002, 5.4.2 NS-EN 626-1	Requirement satisfied. Each substance will be proviede with Safety Data Sheets			
5.2	Are none of the prohibited substances included in the machinery's chemical inventory?	NORSOK S-002, 5.4.2 and Annex D.1	Requirement not applicable			
5.3	Are drip trays provided under all sampling / filling points and other places where spillage might occur?	NORSOK S-002, 5.4.1 NORSOK S-DP-003	Requirement not applicable			
5.5	Are emissions from machinery controlled and in compliance with legislation / NORSOK requirements regarding threshold limit values?	NORSOK S-002, 5.4.3 NS-EN 626-1	Requirement not applicable			

HFE CHECKLIST - ACCESS

	REQUIREMENT	REF.	COMMENTS	RECOMMENDATIONS	REF.	BY
1.1	**HORIZONTAL / VERTICAL DISTANCES**					
1.1.1	Are horizontal workspaces for fixed equipment minimum 700 mm?	NORSOK S-002, Annex B	The requirement is generally satisfied. (e.g some valves near storage tank show horizontal workspace sligh lower 700 mm). During normal operation, handling valve is not foreseen.			
1.1.2	Are centre heights of control devices for standing operations (including valve handles) max. 1800 mm above base ? Are the centre heights of control devices for normal operation controls and for controls where access in an emergency is required 900-1500 mm above base?	NORSOK S-002, Annex B	Requirement satisfied			
1.1.3	Are visual displays located 1100-2000 mm above floor level?	NORSOK S-002, Annex B	Requirement not applicable (no visual displays are provided)			
1.1.4	Is space between fixed cabinets and floor min. 250 mm (or preferably fixed on floor without space underneath)?	NORSOK S-002, Annex B	Requirement not applicable (not fixed cabinets are foreseen outside cabinets)			
1.1.5	Are access ways to permanently and intermittently manned workplaces: - when technically practicable, min. 900 mm wide ? - In any case min 800 mm wide ?	NORSOK S-002, Annex B	Requirement satisfied (wide area where equipment are installed)			
1.1.6	Are vertical clearances in access ways min. 2100 mm? Are vertical clearances in primary/secondary escape route min. 2300 mm?	NORSOK S-002, Annex B	Requirement satisfied (primary escape route >2300 mm)			
1.1.7	Are vertical clearances in work areas and stairs min. 2300 mm?	NORSOK S-002, Annex B NORSOK C-002, 5.7	Requirement satisfied			
1.2	**PIPES AND FLANGES**					

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.2.1	Are spaces between pipe bottoms and floor min. 150 mm?	NORSOK S-002, Annex B	Requirement satisfied			
1.2.2	Are spaces between external diameter of flanges and fixed obstructions min. 250 mm?.	NORSOK S-002, Annex B	Requirement satisfied			
1.3	**GUARDRAILS**					
1.3.1	Are guardrails provided on elevations higher than 500 mm?	NORSOK S-002, Annex B	Requirement satisfied			
1.3.2	Is height from floor to top of the guardrail min. 1100 mm?	NORSOK S-002, 5.1.2	Requirement satisfied (1100 mm)			
1.3.3	Is distance between handrails and any obstruction min. 75 mm?	NORSOK C-002, 5.8	Requirement satisfied			
1.3.4	Are stairways, stepladders and inclined ladders provided with continuous railing on both sides, from the top to the lower level and safely terminated at both ends?	NORSOK S-002, 5.1.2 NORSOK C-002, 5.8	Requirement satisfied (applicable to all platform)			
1.3.5	Is diameter of handrails within the range 25–50mm or in compliance with NORSOK C-002?	NORSOK S-002, 5.1.2. NORSK C-002 EN 12437	Requirement satisfied (about 48.3 mm) (applicable to all platform)			

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.4	**STAIRS**					
1.4.1	Are stairs or ladders provided where there is a change of elevation exceeding 200 mm and access is required? In case this is not comply what is the mitigation measure proposed?	DEP SHELL	Requirement satisfied (vertical ladders provided)			
1.4.2	Are stairs provided where daily access is required?	NORSOK S-002, 5.1.2	Requirement satisfied			
1.4.3	Is width of stairway passage min. 1000 mm, as measured between the inside of handrails (or min. 1200 mm for access to more than two levels) or in compliance with NORSOK C-002?	NORSOK C-002, 5.2	Requirement not applicable (vertical ladders)			
1.4.4	Is the inclination of stairways within the range 21° - 45° ? (Recommended range 30° - 38°)	NORSOK S-002, Annex B	Requirement not applicable (vertical ladders)			
1.4.5	Are the following requirements for steps met: a) Height riser (h) ≤ 250 mm b) Going (g) ≥ 100 mm c) 600 mm ≤ g+2h ≤ 660 mm	EN 12437	Requirement not applicable (vertical ladders)			
1.5	**LADDERS AND STEPLADDERS**					
1.5.1	Is the inclination of: - fixed ladders within the range 76° - 90° ? - fixed stepladders within the range 46° - 75° ?	NORSOK S-002, Annex B	Requirement satisfied (90° vertical ladders)			
1.5.2	Is the width between upright bearers at least 400 mm?	NORSOK S-002, Annex B	Requirement satisfied			
1.5.3	Is there a horizontal clearance of 650 mm in front of ladders, and a horizontal clearance of 200 mm behind the front of the rungs (150 mm for discontinuous obstacles)?	NORSOK S-002, Annex B	Requirement satisfied, even if, at the moment, the final design of vertical ladders is not yet defined in the 3D model.			
1.5.4	Are rungs evenly spaced, with vertical spacing min. 250 mm and max 300 mm.	NORSOK S-002, Annex B	Requirement satisfied			

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.5.5	Are rungs provided with a non-slip surface?	NORSOK S-002, Annex B	Rungs have a square shape, that prevent slipping off the end of the rungs, but the surface is not classified non-slip surface	Consider to provide non-slip surface to the rungs of vertical ladders	1	Rosetti - Structural

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.5.6	Are safety cages, starting at height 2200 - 3000 mm, provided for ladders higher than 3000 mm?	NORSOK S-002, Annex B	Requirement satisfied			
1.5.7	Is there a rest landing arranged at each 6000 mm for ladders above 10,000 mm?	NORSOK S-002, Annex B	Requirement not applicable			
1.6	**GATES**					
1.6.1	Are self-closing gates arranged at the top of ladders	NORSOK S-002, 5.1.2	Requirement not applicable			
1.7	**HATCHES AND MANWAYS**					
1.7.1	Do hatches provided have an access opening of min. 800x800 mm (min. 600x600 mm for access to cofferdams and tanks from floor/platform)?	NORSOK S-002, Annex B	Requirement satisfied (H2 vessel provided with hatches; no maintenance is expected).			
1.7.2	Are access openings in vertical partitions into cofferdams, tanks etc. equipped with hand grips on both sides above the opening ?	NORSOK S-002, 5.1.2	Requirement not applicable			
1.7.3	Are inspection hatches side hinged ?	NORSOK S-002, 5.2.1.2	Requirement satisfied (H2 vessel provided with hatches side hinged).			

HFE CHECKLIST - ACCESS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
1.7.4	Are openings in deck larger than 100x100 mm secured by guard-rail or similar?	NORSOK S-002, Annex B	The requirement has been considered for the pipe / instrument floor penetration. These openings do not represent a hazard for the operators (openings usually less than 100x100 mm and toe boards applied for protection if necessary).			
1.8	**DOORS**					
1.8.1	Do doors have a clear opening of at least 750 mm width and 2050 mm height?	NORSOK S-002, 6.1	Requirement not applicable			

HFE CHECKLIST - SAFETY PRINCIPLES AND ARRANGEMENTS

	REQUIREMENT	REF.	COMMENTS	RECOMMENDATIONS	REF.	BY
2.1	**Storage of dangerous goods**					
1.1.1	Areas for storage of flammable, radioactive, explosive or otherwise hazardous substances should be marked with appropriate warning signboards.	DNVGL-OS-A101	Requirement satisfied (H2 storage vessel will be provided with appropriate warning signal.			
1.1.2	Flammable liquids which give off dangerous vapours and flammable gases shall be stored in a well ventilated space or on deck.	DNVGL-OS-A101	Requirement satisfied (not flammable liquids are present in platform)			
2.2	**Cranes and lay down areas**					
2.2.1	Cranes and lay down areas shall be located so as to minimise the risk of load handling or dropped object damage to systems and structures.	DNVGL-OS-A101	Requirement satisfied. Crane is located in a specific position in order to decrease the dropped object risk to platform equipment. Crane is provided with limit switch.			
2.2.2	The need for load handling above pressurised hydrocarbon equipment, hazardous inventories, and equipment important for safety should be avoided as far as possible. Suitable impact protection should be provided where such lifting cannot be avoided.	DNVGL-OS-A101	Requirement satisfied. Crane is located in a specific position in order to decrease the dropped object risk to platform equipment. Crane is provided with limit switch.			
2.2.3	Lay down areas should be provided with heavy-duty barriers to prevent damage to adjacent equipment.	DNVGL-OS-A101	Requirement satisfied.			
2.2.4	Lay down areas should be located outside hazardous areas.	DNVGL-OS-A101	Requirement satisfied.			
2.3	**Railings and barriers**					

HFE CHECKLIST - SAFETY PRINCIPLES AND ARRANGEMENTS

	REQUIREMENT	REF.	COMMENTS	RECOMMENDATIONS	REF.	BY
2.3.1	The guard rails shall have at least three courses so arranged that the lowest rail is not more than 230 mm above the deck or toe board and the highest rail not less than 1 m above the deck.	DNVGL-OS-A101	Requirement satisfied			
2.3.2	Every deck, gangway, stairway and opening from which an object could drop more than 2 m, shall, where practicable, be provided with a toe board of not less than 150 mm height.	DNVGL-OS-A101	Requirement satisfied (applicable to all platform)			
2.4	**General principles for Hazardous area (with potential for release of flammable / comburent gas, vapours or liquids during normal operation)**					
2.4.1	Location of a continuous source within an enclosed area, or in open areas with significant obstructions to ventilation, shall be avoided.	DNVGL-OS-A101 Best practice	Requirement satisfied. Open area, no significat obstruction. ATEX study available. Dispersion study from H2 vent.			
2.6	**Escape routes**					
2.6.1	Safe, direct and unobstructed (not be blocked by portable equipment, supplies or piping/valves) exits, access, and escape routes shall be provided from all regularly manned areas of the mobile unit or offshore installation to temporary refuge, muster areas and embarkation or evacuation points.	DNVGL-OS-A101	Requirement satisfied.Two stairs in opposite location for secondary muster area (interface deck) and primary muster area (interface level). Two ladders availbe on the structure on the top of storage vessel.			

HFE CHECKLIST - SAFETY PRINCIPLES AND ARRANGEMENTS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
2.6.2	All areas shall be provided with at least two exits and at least secondary escape routes, such that at least one exit and the connected escape route will be passable during an accidental event. Dead-ends are allow for a maximum of 5m.	DNVGL-OS-A101	Requirement satisfied.Two stairs in opposite location for secondary muster area (interface deck) and primary muster area (interface level). Two ladders availbe on the structure on the top of storage vessel.			
2.7	**Muster areas**					
2.7.1	Easily accessible muster areas shall be clearly defined on the offshore installation. All muster areas shall be located with direct and ready access to the escape mean or other life-saving appliances.	DNVGL-OS-A101	Requirement satisfied (presence of safety cabinet and other life saving appliances, see 123A90-DDL-SAF-DL-30025)			
2.7.2	Each muster station shall have sufficient space to accommodate all persons assigned to muster at that station, but at least 0.35 m2 per person.	DNVGL-OS-A101	Requirement satisfied (primary muster point: 8 m2 for 10 people)			
2.8	**Emergency lighting**					
2.8.1	All regularly manned areas on the mobile unit or offshore installation shall be equipped with emergency lighting, which is supplied from the emergency source of power. The illumination level shall be sufficient to ensure that necessary emergency response actions, including reading of signs and layouts, can take place efficiently.	DNVGL-OS-A101	Requirement satisfied (note that maintenance activities is foreseen only during daytime)			
2.8.2	Escape routes, access routes and exit points shall be illuminated so they are readily identifiable in an emergency.	DNVGL-OS-A101	Requirement satisfied (note that maintenance activities is foreseen only during daytime)			
2.9	**Marking and warning signboards**					

HFE CHECKLIST - SAFETY PRINCIPLES AND ARRANGEMENTS						
REQUIREMENT		**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
2.9.1	Signs and marking should show exit points and the direction to muster areas, embarkation areas and means of escape to sea.	DNVGL-OS-A101	Requirement satisfied (signs and marking for muster point and escape route will be part of a dedicate layout, in progress).			
2.10	**Communications and alarms**					
2.10.1	Communication and alarm systems shall be provided to alert all personnel on board, at any location, of an emergency. The systems shall be suitable to provide instructions for emergency response.	DNVGL-OS-A101	Requirement satisfied (sounders will be installed in all level of platform).			

HFE CHECKLIST - ERGONOMICS						
	REQUIREMENT	**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
3.1	Is the height of table top for seated work within the range 680-750 mm, and easily adjustable from work position?	NORSOK S-002, Annex B	Requirement not applicable.			
3.2	Is the height of table top for standing work within the range 800-1050 mm, and easily adjustable from work position? NORSOK S-002, Annex B	NORSOK S-002, Annex B	Requirement not applicable.			
3,3	Is it possible to operate handles and push buttons with gloves on?	NORSOK S-002, Annex B	Requirement satisfied.			

HFE CHECKLIST - SAFETY PRECAUTIONS

	REQUIREMENT	REF.	COMMENTS	RECOMMENDATIONS	REF.	BY
4.1	Are anti-skid surfaces provided in access ways and work areas? (The surfaces of decks, walkways, platforms, stairs and ladder rungs etc. shall be non-slip, and designed for drainage and easy cleaning of contaminants like mud and oil, where relevant)	EN 292-1, 4.2 NORSOK S-002, 5.1.2 DNVGL-OS-A101	Requirement satisfied for escape route and muster point.			
4.2	Is protection against personnel contact with hot surfaces above 70°C and cold surfaces below -10°C provided?	NORSOK S-002, 5.3.2 EN 292-1, 4.4	Requirement not applicable.			
4.3	Are dead end corridors and platforms exceeding 5 m length provided with min. 2 exits?	NORSOK S-DP-001, 7.2	Requirement not applicable			
4.4	Are safe distances between possible moving objects exceeding the following minimum gaps to avoid crushing of the body parts at risk: • Body > 500 mm • Head > 300 mm • Leg > 180 mm • Foot > 120 mm • Toe > 50 mm • Arm > 120 mm • Hand > 100 mm • Finger > 25 mm	NORSOK S-002 EN 349	Requirement not applicable.			

HFE CHECKLIST - HAZARDOUS SUBSTANCES						
	REQUIREMENT	**REF.**	**COMMENTS**	**RECOMMENDATIONS**	**REF.**	**BY**
5.1	Are Safety Data Sheets, approved according to applicable regulation for all chemicals delivered or instructed to be used with the machinery?	NORSOK S-002, 5.4.2 NS-EN 626-1	Requirement satisfied. Each substance will be proviede with Safety Data Sheets			
5.2	Are none of the prohibited substances included in the machinery's chemical inventory?	NORSOK S-002, 5.4.2 and Annex D.1	Requirement not applicable			
5.3	Are drip trays provided under all sampling / filling points and other places where spillage might occur?	NORSOK S-002, 5.4.1 NORSOK S-DP-003	Requirement not applicable			
5.5	Are emissions from machinery controlled and in compliance with legislation / NORSOK requirements regarding threshold limit values?	NORSOK S-002, 5.4.3 NS-EN 626-1	Requirement not applicable			