

CNS OPERATIONS MANUAL
ADMINISTRATIVE PROCEDURE 0.36.2

UNDERWATER AND ABOVE
MOVING WATER WORK ACTIVITIES

USE: INFORMATION
QUALITY: QAPD RELATED
EFFECTIVE: 4/2/04
APPROVAL: ITR-RDM
OWNER: M. I. STAUFFER
DEPARTMENT: SAFETY

1.	PURPOSE	1
2.	PRECAUTIONS AND LIMITATIONS	1
3.	REQUIREMENTS	2
4.	DIVING OPERATIONS	5
5.	RADIOLOGICAL DIVING OPERATIONS	11
6.	SCUBA DIVING OPERATIONS	13
7.	SURFACE-SUPPLIED AIR DIVING OPERATIONS	13
8.	WORKING OVER OR NEAR MOVING WATER	14
9.	RECORDS	14
	ATTACHMENT 1 SURFACE SUPPLIED AIR PRE-DIVE CHECKLIST INFORMATION SHEET	15
	ATTACHMENT 2 SURFACE SUPPLIED AIR POST-DIVE CHECKLIST	16
	ATTACHMENT 3 SURFACE SUPPLIED AIR DIVE LOG	17
	ATTACHMENT 4 EMERGENCY INFORMATION AND TELEPHONE LIST	18
	ATTACHMENT 5 EQUIPMENT LOG	19
	ATTACHMENT 6 INFORMATION SHEET	20

REV.	DATE	CHANGES
5	9/5/02	Changed SORC to SORC/IQA in Attachment 6, Step 1.1.1.2.b.
6	see above	Added Step 2.3.2 to Attachment 6 to address SEN 245.

1. PURPOSE

1.1 This procedure is designed to establish safety requirements and a method for controlling:

1.1.1 Underwater work activities - SCUBA or surface air supplied.

1.1.2 Surface air supplied operations in radiologically controlled immersion areas.

1.1.3 Above moving water work activities.

2. PRECAUTIONS AND LIMITATIONS

2.1 To avoid the possibility of cave-in when manually dredging, no more that 3' in depth of material should be moved at any one time.

2.2 All dive team members shall be trained in cardiopulmonary resuscitation and First Aid.

2.2.1 American Red Cross standard course or equivalent.

2.2.2 Documentation shall be provided to NPPD upon request.

- 2.3 All dive team members shall be briefed on the documents referenced in Section 2 of Attachment 6, as well as this procedure. Each member of the dive team shall be thoroughly familiar with these documents and shall conduct all diving and related support operations in strict accordance.
- 2.4 It is the Diving Supervisor's responsibility to ensure all diving operations within tanks or confined spaces are monitored by Radiation Protection personnel for oxygen deficient atmospheres prior to dive team member entry into the tank or confined space.
- 2.4.1 Results of the monitoring shall be entered on the Hazardous Work Permit.
- 2.4.2 Should the tank or confined space prove to be oxygen deficient, it shall be vented and retested prior to dive team members entry.
- 2.5 Dive Teams shall provide NPPD with documentation of their Grade "D" breathing certification upon request.

3. REQUIREMENTS

- 3.1 Ensure following equipment and materials are available:

3.1.1 All diving equipment shall meet the minimum standards and requirements described in OSHA Standard 29CFR1910, Subpart T.

3.1.2 RADIOLOGICAL DIVING SPECIAL EQUIPMENT REQUIREMENTS

3.1.2.1 DIVING HELMET

- a. Only rigidly constructed free-flow helmets will be used, except under special conditions (i.e., DESCO POT or DIVEX 2000, or an approved OSHA equivalent).
- b. Exhaust valves shall be of the type designated to prevent the back flow of water into the helmet during periods of high or low air flow when a negative pressure exists in the helmet or in the presence of debris in the water.
 1. DESCO dual exhaust valves, or an approved OSHA equivalent, is currently approved for diving in radiologically contaminated water.
- c. Helmets must be capable of mating directly to a compatible drysuit creating an air/water tight seal.

3.1.2.2 DIVING SUIT

- a. Only drysuits shall be used (i.e., Viking H.D. or an approved OSHA equivalent).
- b. Suits shall have permanently installed boots and shall be capable of mating with water-tight gloves and the diving helmet with a positive air-tight seal.

- c. Suits fitted with low pressure air inflator valves shall have inflator hoses positively engaged prior to the diver entering the water. Care should be taken to prevent accidental disengagement at the quick disconnect fitting.
- d. Suits fitted with low pressure air inflator valves must also be fitted with a functional exhaust valve. Gloves shall be leak checked during suit up.
- e. Gloves mated to the suit shall be constructed of a water-tight non-porus material.

3.1.2.3 DIVER CARRIED EMERGENCY AIR SUPPLY (DCEAS)

- a. The requirement for DCEAS will be determined based on water depth, diver access to the work site, and the time required to remove a diver from the water and disengage the helmet/suit mate-up without contaminating the diver.
- b. A DCEAS shall be required when:
 - 1. Water depth exceeds 50'.
 - 2. The diver must enter an enclosed space, or work in an area where there is significant risk of fouling, or in any other situation or environment which may prevent direct access to the surface.
 - 3. The duration of the secondary air supply is insufficient to allow removal from the water, rinsing of the diver, and removal of the helmet without contaminating the diver following a loss of the primary air supply.

3.1.2.4 PRIMARY AIR SUPPLY

- a. Primary air supply for the operations shall be electric or diesel powered low pressure compressor.
- b. Combined output for demand regulated helmets shall be sufficient to supply all divers at maximum depth with a flow rate of no < 30 cfm at a supply pressure of 115 psig above ambient water pressure.
- c. When using a continuous flow diving helmet, the air supply shall be capable of supplying no < 6 acfm to each diver at the working depth.

3.1.2.5 SECONDARY AIR SUPPLY

- a. High pressure storage bottles containing a minimum volume of 200 ft³ shall comprise the secondary air supply.

- b. All high pressure storage bottles shall be fitted with a high flow regulator capable of reducing the supply pressure from 2000 psig to no < 50 psi above ambient water pressure.
- c. Secondary air shall be routed directly to a control console located on the dive station and accessible to all dive support crew.
- d. Sources of diver's breathing air shall be analyzed every 6 months by the contractor and shall meet the requirements of Grade "D" breathing air, and a certificate of compliance shall be provided to the District's representative upon request.

3.1.2.6 AIR CONTROL CONSOLE

- a. The air control console shall be located at the dive station.
- b. The control console shall be capable of providing direct read-out of primary air system supply pressure and isolating primary air from the system while routing secondary air to the divers. Check valves shall be located in the system so that secondary air is not lost through the primary air system in the event of a valve, fitting, piping, or hose failure.

3.1.2.7 DIVING SYSTEM DRAWINGS AND CHECKLIST

- a. The Dive Team Supervisor or designee shall develop system drawings and checklists based on the installed system.

3.1.2.8 RADIOLOGICAL MONITORING

- a. Requirements for radiological monitoring shall be determined in cooperation with CNS Radiation Protection and ALARA personnel.
- b. Monitoring devices shall be installed so that the diver's mobility is not impaired and the risk of damage to the diving suit is eliminated.
- c. A Special Work Permit (SWP) or Radiological Control Area Work Permit (RCAWP) shall be issued, when required, stipulating the radiological controls and practices to be utilized during the diving operation.
- d. An ALARA job review shall be performed by the ALARA Coordinator.

3.1.3 ABOVE MOVING WATER SPECIAL EQUIPMENT REQUIREMENTS

- 3.1.3.1 Personnel working over moving water, where the danger of drowning exists, shall be provided with a U.S. Coast Guard approved life jacket or buoyant work vest.
- 3.1.3.2 Ring buoys with at least 90' of line shall be provided and readily available for emergency reserve operations.

3.1.3.3 A lifesaving skiff shall be immediately available on-site where personnel are working over or adjacent to hazardous moving water.

3.1.4 FIRST AID SUPPLIES

3.1.4.1 A First Aid kit appropriate for the diving operation and approved by a physician shall be available at the dive locations.

3.1.4.2 In addition to any other First Aid supplies, the following shall be available at a dive location:

- a. An American Red Cross standard First Aid handbook or equivalent.
- b. A bag-type manual resuscitator with transparent mask and tubing.
- c. A list shall be kept of the telephone or call numbers for following:
 1. Accessible hospital.
 2. Available physician.
 3. Available means of transportation.
 4. The nearest U.S. Coast Guard Rescue Coordination Center.

3.2 The Dive Team Supervisor shall ensure each dive team member is familiar with the appropriate sections of this procedure and have experience or training in the following:

3.2.1 The use of tools, equipment, and systems relevant to the assigned task.

3.2.2 Techniques of the assigned diving mode.

3.2.3 Diving operations and emergency procedures. No diving operations shall be planned outside of the "no decompression limits".

3.2.4 Radiation Protection procedures and requirements for dive, when applicable.

4. DIVING OPERATIONS

4.1 Planning of a diving operation by the Dive Team Supervisor and the CNS Job Supervisor shall include an assessment of the safety and health aspects of the operation by completing Attachment 1, Hazardous Work Permit (HWP), and Attachment 2, HWP Supplementary Time Report Form, of Procedure 0.36. Areas included should be:

4.1.1 Diving mode.

4.1.2 Surface and underwater conditions and hazards.

4.1.3 Breathing gas supply (including reserves).

4.1.4 Thermal protection.

- 4.1.5 Diving equipment and systems.
- 4.1.6 Dive team assignments and physical fitness of dive team members (including any impairment known to the District).
- 4.1.7 Emergency procedures.
- 4.2 To minimize hazards to the dive team during hazardous activities, diving operations shall be coordinated with other activities in the vicinity which are likely to interfere with the diving operation.
- 4.3 The Breathing Gas Supply System including reserve breathing gas supplies, masks, helmets, and thermal protection shall be inspected by the Dive Team Supervisor or designee prior to each dive.
- 4.4 A pre-dive briefing with the dive team members shall be conducted by the Dive Team Supervisor and the CNS Job Supervisor on:
 - 4.4.1 The task to be undertaken.
 - 4.4.2 The appropriate sections of this procedure and its safety procedures for the diving mode.
 - 4.4.3 Any unusual hazards or environmental conditions likely to affect the safety of the diving operations.
 - 4.4.4 Any modifications to operating procedures necessitated by the specific diving operation.
 - 4.4.5 Prior to making individual dive team member assignments, the Dive Team Supervisor shall inquire into the dive team member's current state of physical fitness, and indicate to the dive team members the procedure for reporting physical problems or adverse physiological effects during and after the dive.
- 4.5 Establish communication between the Control Room and the dive team. An operational two-way voice system shall be used between:
 - 4.5.1 Each surface-supplied air diver and a dive team member at the dive location.
 - 4.5.2 The dive location and the Control Room to obtain emergency assistance via the station galtronics, portable radios, or sound power.
- 4.6 EMERGENCY PROTOCOL
 - 4.6.1 The accident management protocol will be the use of the CNS EMT Squad and the Radiation Protection Department.
 - 4.6.2 This protocol includes following:
 - 4.6.2.1 CNS supplied EMT medical assistance.

- 4.6.2.2 Removal of an incapacitated diver from the water will be done with the assistance of CNS EMTs and/or Confined Space and Rope Rescue Team, as necessary.
 - 4.6.2.3 Removal of an incapacitated diver from the contaminated area will be accomplished by CNS EMTs, Confined Space and Rope Rescue Team, and Radiation Protection.
 - 4.6.2.4 Evacuation of an injured diver to an appropriate medical facility by either Station Ambulance or Nemaha Rescue Squad shall be determined by the EMTs.
 - 4.6.2.5 Procedure 5.7.24 provides guidance associated with the medical evacuation of a potentially contaminated individual.
 - 4.6.2.6 Procedure 5.7.24 provides guidance associated with medical treatment and the evacuation of a non-contaminated individual.
 - 4.6.2.7 Specific procedures for dealing with a diving accident requiring treatment by recompression are the responsibility of the Contractor.
- 4.7 A means capable of physically supporting the diver shall be provided for entering and exiting the water.
- 4.7.1 The means provided for exiting the water shall extend below the water surface.
 - 4.7.2 A means shall be provided to assist an injured diver from the water.
- 4.8 HAND-HELD POWER TOOLS AND EQUIPMENT
- 4.8.1 Hand-held electrical tools and equipment shall be de-energized before being placed into or retrieved from the water.
 - 4.8.2 Hand-held power tools shall not be supplied with power from the dive locations until requested by the diver.
- 4.9 When welding and burning, a current supply switch to interrupt the current flow to the welding or burning electrode shall:
- 4.9.1 Be tended by a dive team member in voice communication with the diver performing the welding or burning.
 - 4.9.2 Be kept in the OPEN position except when the diver is welding or burning.
 - 4.9.3 The tending dive team member shall:
 - 4.9.3.1 Ensure welding machine frame is grounded.
 - 4.9.3.2 Ensure welding and burning cables, electrode holders, and connections are capable of carrying the maximum current required at the work and are properly insulated.

4.9.3.3 Ensure insulated gloves are provided to divers performing welding and burning operations.

4.9.3.4 Ensure prior to welding or burning on closed compartments, structures, or pipes, which may have contained a flammable vapor or in which flammable vapor may be generated by the work that they are vented, flooded, or purged with a mixture of gases which will not support combustion.

4.10 The working interval of a dive shall be terminated when:

4.10.1 A diver requests termination.

4.10.2 A diver fails to respond correctly to communications or signals from a dive team member.

4.10.3 Communications are lost and cannot be quickly re-established between the diver and a dive team member at the dive location.

4.10.4 Communications are lost and cannot be quickly re-established between the Dive Team Supervisor and the person controlling the dive vessel in live boating operations or between the Control Room and dive location.

4.10.5 A diver begins to use diver-carried reserve breathing gas or the dive-location reserve breathing gas.

4.11 COORDINATION WITH SITE PERSONNEL

4.11.1 All plans for diving shall be coordinated through the joint efforts of the Dive Team Supervisor, CNS Project Manager, Design Engineer or CNS Job Supervisor, the ALARA Coordinator (for radiologically controlled areas), and Radiation Protection (HP).

4.11.2 The Dive Team Supervisor should coordinate directly with the CNS Project Engineer when assigned or the CNS Job Supervisor with regard to conducting all diving operations.

4.12 The Dive Team Supervisor has the ultimate and final decision on whether it is safe to conduct diving operations after receiving authorization to dive from the CNS Project Engineer, when assigned, or the CNS Job Supervisor and verifying any hazardous equipment has been deactivated and tags are properly filled out and installed prior to commencing diving operations.

4.12.1 The Dive Team Supervisor shall ensure all equipment Clearance Orders associated with diver safety are in effect.

4.12.2 The tagging verification shall be completed prior to commencing dive operations. Verification shall be documented on the Shift Dive Log.

- 4.12.3 During verification of tag outs, the Dive Team Supervisor shall review with designated CNS personnel developing plant evolutions which may effect diver safety.
- 4.12.4 Breaker positioning should be verified by the Diving Supervisor prior to commencing diving operations.
- 4.13 Tags affecting diving operations shall be released by the Work Control Center or Control Room only after he has concurred with and has the agreement of the personnel on the Clearance Order in Step 4.12.1. The Dive Team Supervisor shall ensure:
 - 4.13.1 All divers are safely clear of the diving area and do not plan to re-enter the area.
 - 4.13.2 All tools and equipment are removed from the diving area or otherwise secured.
- 4.14 The Dive Team Supervisor and the CNS Job Supervisor shall conduct a pre-job briefing with the Dive Supervisors prior to commencing diving operations.
- 4.15 After completion of any dive, the Dive Team Supervisor or designee shall:
 - 4.15.1 Check physical condition of divers.
 - 4.15.2 Instruct divers to report any physical problems or adverse physiological effects including symptoms of decompression sickness.
 - 4.15.3 Alert divers to the potential hazards of flying after diving.
- 4.16 Record keeping as it pertains to the diving operation and related work shall be the responsibility of the Dive Team Supervisor. The following information shall be recorded and maintained for each diving operation on Attachment 3:
 - 4.16.1 Names of dive team members, including the Dive Team Supervisor.
 - 4.16.2 Date, time, and location.
 - 4.16.3 Diving mode used.
 - 4.16.4 General nature of work performed.
 - 4.16.5 Approximate underwater and surface conditions (visibility, water temperature, and current speed).
 - 4.16.6 Maximum depth and bottom stay time for each diver.
 - 4.16.7 Pre-Dive and Post-Dive Checklist shall be completed by the Dive Team Supervisor (refer to Attachments 1 and 2).

- 4.16.8 A standard Dive Log format shall be used to record individual dive profile data on all dive team members. Current dive record forms shall be provided to the Dive Team Supervisor by the Maintenance Supervisor, Project Manager, Design Engineer, or designee (refer to Attachment 3).
- 4.16.9 Attachment 4 shall be maintained and used for emergency information.
- 4.16.10 The above records shall be maintained at the dive location and shall contain the following documents:
- 4.16.10.1 OSHA Standard 29CFR1910, Subpart-T, Commercial Diving Operations.
 - 4.16.10.2 Copies of documents related to the diver safety. This shall include radiological survey maps and data, if required.
 - 4.16.10.3 Copies of all work procedures related to diving operations.
 - 4.16.10.4 Copies of HWP's and if radiological, SWP's or RCAWP's relating to diving and diving support operations.
 - 4.16.10.5 Piping, instrument, and flow diagrams of the primary and secondary air supply system as installed.
- 4.16.11 Every effort should be made to avoid radiological contamination of the Dive Record.
- 4.16.12 Individual daily exposure will be maintained on the SWP or RCAWP's. This data should be monitored by the Dive Team Supervisor.
- 4.16.13 RUNNING LOG (RADIOLOGICAL)
- 4.16.13.1 The Dive Team Supervisor of radiological dives shall maintain a Running Log.
 - a. The Running Log should contain, at a minimum, a summary of ALL daily activities.
 - b. Significant events should be described in detail.
 - c. All entries should contain the pertinent information (e.g., names, dates, times, etc.) necessary to completely and accurately reconstruct the evolutions, developments, and occurrences of any activity or event.
 - d. Log entries shall be clear, concise, factual, and professional, and shall not contain unnecessary trivia or personal comments.
 - 4.16.13.2 The Running Log is an auditable document and shall be considered a part of the work record.

5. RADIOLOGICAL DIVING OPERATIONS

- 5.1 The Dive Team Supervisor shall verify tag-out with designated CNS personnel at the beginning of each work shift.
 - 5.1.1 Review HWP and HWP Supplementary Time Report Form, updating it as necessary.
- 5.2 The Dive Team Supervisor or designee shall conduct equipment checks per job-start checklist.
- 5.3 The Dive Team Supervisor or designee shall conduct a leak check of all diving suits per the following:
 - 5.3.1 Attach helmet to neck yoke of suit, blank off wrist seals, and open the suit exhaust valve fully counter-clockwise.
 - 5.3.2 Inflate suit using low pressure inflator until air is vented from suit exhaust valve.
 - 5.3.3 Close suit exhaust valve and observe suit for loss of pressure. Using a leak-check solution, check all seams, connections, and fittings. Also, apply leak-check solution to the suit material.
 - 5.3.4 There should be no visible leaks. The suit should remain tightly inflated throughout the leak check procedure without the need to add additional air.
 - 5.3.5 A record of all leak checks shall be maintained in the Running Log. Identify the person conducting the leak check and record the serial number of the suit.
- 5.4 The Dive Team Supervisor shall conduct a briefing with all the dive team members to review the appropriate sections of this procedure and its safety procedures, as well as, the HWP requirements.
- 5.5 ALARA and radiological controls review of diving operations and pre-job briefing by Radiation Protection and ALARA personnel shall be conducted. Radiological control practices relating to diving operations will be job specific and shall be developed by Radiation Protection personnel per applicable station procedures. Radiological control requirements and special instructions shall be identified on a SWP or RCAWP.
 - 5.5.1 Radiological control practices shall include but not be limited to the following areas:
 - 5.5.1.1 Briefing of dive teams by Radiation Protection.
 - 5.5.1.2 The HWP and SWP/RCAWP as they relate to diving and diving support operations.
 - 5.5.1.3 Pre-dive radiation surveys by Radiation Protection.
 - 5.5.1.4 Dress-out requirements for topside personnel.
 - 5.5.1.5 Dress-out requirements for divers.

- 5.5.1.6 Dosimetry requirements for divers and diver support personnel.
- 5.5.1.7 Designation of a specific diver dressing area within the contaminated area.
- 5.5.1.8 Underwater radiological surveys.
- 5.5.1.9 Daily tracking of accumulated dose.
- 5.6 Practices for exit of the diver from the water shall include:
 - 5.6.1 Dive team members duties and Radiation Protection requirements.
 - 5.6.2 Rinsing the diver with demineralized water as he exits the water.
 - 5.6.3 Handling the diver and equipment during exit and unsuiting.
 - 5.6.4 Special radiological monitoring during exit.
- 5.7 Establish emergency protocol per Step 4.6.
- 5.8 Pick up dosimetry anti-contamination area clothing (Anti C's). Leak check all rad protection gloves taken into contaminated area for diver use.
- 5.9 Dress-out and sign-in on the SWP/RCAWP and HWP.
- 5.10 Enter into the contaminated area.
- 5.11 Conduct pre-dive system checks for portions of system installed outside the contaminated area.
- 5.12 Establish communication with the Control Room.
- 5.13 Complete Pre-Dive Checklist.
- 5.14 Leak check helmet non-return valve.
 - 5.14.1 When helmets are located within the contaminated area, leak check shall be accomplished by mechanical means only.
- 5.15 Divers move directly to dress-out area established within the contaminated area.
- 5.16 Tenders shall don clean gloves and assist divers in donning diving suits.
 - 5.16.1 In general, Tenders will handle only the outside surfaces of the diving suits and equipment while divers will handle only the inside surfaces.
- 5.17 Divers will move to the dive station and complete suit-up near the entry point.
- 5.18 Notify Work Control Center (WCC) or Control Room and other designated personnel that diving operations are commencing.

- 5.19 During entry into the water, the diver shall pause near the surface and conduct communications and leak checks before proceeding to the work site.
- 5.20 Underwater radiological surveys shall be conducted per current Radiation Protection practices prior to beginning underwater work and during the work sequence as directed by SWP/RCAWP.
- 5.21 Diver exit shall be conducted per Radiation Protection practices.
 - 5.21.1 Protect internal equipment surfaces from contamination during diver undressing.
 - 5.21.2 Install protective barriers, as required, to prevent contamination of the internal surfaces of helmets, suits, fittings, and hoses when gear is idle.
 - 5.21.2.1 Extra care shall be taken to ensure that open equipment orifices are promptly protected and remain so until an air-tight connection is re-established.

6. SCUBA DIVING OPERATIONS

- 6.1 SCUBA diving operations shall not be conducted unless for emergency rescue situations or with written permission of the Industrial Safety Coordinator.

7. SURFACE-SUPPLIED AIR DIVING OPERATIONS

- 7.1 The Job Supervisor shall conduct a pre-job briefing on the appropriate sections of this procedure and its completed HWP and HWP Supplementary Time Report. Each diver and dive team member shall sign in and out during the diving operation on Attachment 2.
- 7.2 Each diver shall be continuously tended while in the water. This continuous tending shall also provide positive control of the diver's umbilica air line whenever diving occurs around rotating equipment.
- 7.3 A diver shall be stationed at the underwater point of entry when diving is conducted in enclosed or physically confining spaces.
- 7.4 Each diving operation shall have a primary breathing gas supply sufficient to support divers for the duration of the planned dive including decompression.
- 7.5 An extra breathing gas hose capable of supplying breathing gas to the diver in the water shall be available to the standby diver.
- 7.6 Except when heavy gear is worn or where physical space does not permit, a diver-carried reserve breathing gas supply shall be provided whenever the diver is prevented by the configuration of the dive area from ascending directly to the surface.

8. WORKING OVER OR NEAR MOVING WATER

- 8.1 The CNS Job Supervisors of personnel required to work over or near moving water shall review the appropriate sections of this procedure and its safety requirements and the completed HWP. Each person working over or near moving water shall sign Attachment 2, HWP Supplementary Time Report Form (times in and out are not required).
- 8.2 Personnel working over or adjacent to hazardous moving water (i.e., Missouri River), where the danger of drowning exists, shall be provided with U.S. Coast Guard approved life jackets or buoyant work vests or shall be otherwise protected by fall protection equipment.
- 8.3 Prior to and after each use, the buoyant work vests or life preservers shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used.
- 8.4 Ring buoys with at least 90' of line shall be provided at the northeast and southeast corners of the Intake Structure and readily available for emergency rescue operations.
- 8.5 A life saving skiff shall be immediately available on-site where personnel are working over moving water.

9. RECORDS

- 9.1 Attachments (when attached to work packages or work documents) are sent to CNS Records (quality record upon work package or work documents closure).
- 9.2 Attachments which are not part of a work package or work document should be sent to the Industrial Safety Coordinator or designee for maintenance of the file (not a quality record).

ATTACHMENT 1 SURFACE SUPPLIED AIR PRE-DIVE CHECKLIST INFORMATION SHEET
--

ATTACHMENT 1 SURFACE SUPPLIED AIR PRE-DIVE CHECKLIST INFORMATION SHEET

(X = Item Complete; O = Skip And Return; N/A = Not Applicable)

- Dive team members have reviewed the appropriate sections of this procedure pertaining to the mode of diving to be used
- Running Log opened
- Pre-job briefing conducted (including ALARA and Radiation Protection briefing)
- Dive Log opened
- Accident management protocol posted
- Communications check (radio, telephone, other)
- Walkdown of tag-out complete (Clearance Order Number: _____)
Name on Clearance Order: _____
- Crew signed in on HWP and SWP/RCAWP (if required)
- Dive flag out
- First Aid kit and First Aid manual
- A bag-type manual resuscitator with transparent mask and tubing
- Provisions made for emergency removal of diver from water
- Dive station clean and neatly arranged
- Deck hose and whips safely routed
- Divers air and emergency air appropriately tagged at source and at all shutoff valves
- Key support personnel on hand and briefed
- Leak check suits, if required
- Main Air System check
- Main air on line (supply pressure: _____ psig over bottom)
- Fuel and oil for compressor on hand
- Leak check Main Air System/all fittings secure
- Leak check helmet non-return valves
- Functional check of Main Air System and all hats
- Communications check; all hats and diver radios
- Spare radio battery for each radio
- Divers ready to dive
- High pressure emergency air on line
Bottle #1: _____ psig; #2: _____ psig;
Bottle # _____ in use; regulator set to _____ psig over bottom
Bottle # _____ standby; valve closed
- DCEAS bottle pressures
Bottle #1: _____ psig; #2 _____ :psig; #3 _____ psig
- Functional check of High Pressure Emergency Air System
- Functional check of diver carried bailouts
- All required documentation complete and inserted in log
- WCC or Control Room notified that dive operations are commencing (required once per shift)

Dive Team Supervisor's Signature	/	Time	/	Date
----------------------------------	---	------	---	------

ATTACHMENT 3 SURFACE SUPPLIED AIR DIVE LOG

ATTACHMENT 3 SURFACE SUPPLIED AIR DIVE LOG

Date: _____ Time: _____

Job Function Number: _____ CNS Location: _____

CNS Project Engineer/Design Engineer: _____

Emergency Numbers:

Medial Assistance: _____ Ambulance: _____

Recompression Chamber: _____

Other Numbers: _____

Supervisor: _____ Divers - 1: _____; 2: _____; 3: _____

Tenders - 1: _____; 2: _____; 3: _____

Other (Laborers, etc.): _____

(Use Military Time)

Arrive On-Site: _____ Dive Station Setup: _____ Leave Site: _____

Pre-Dive Checklist Complete: _____ / _____ / _____
Time Supervisor Signature Diver Signature

DCEAS Check: _____ DCEAS Pressure: _____ Emergency Air Check: _____

Dive Number	Diver	Tender	Time In	Time Out	Max Depth	Total Time	Comments
1							
2							
3							
4							
5							

Air Temperature: _____ °F; Water Temperature: _____ °F; Current: _____ k;

Visibility: _____ feet; Wind Velocity: _____ k;

General Diving Conditions: Good / Fair / Poor (circle one)

ATTACHMENT 4 EMERGENCY INFORMATION AND TELEPHONE LIST

ATTACHMENT 4 EMERGENCY INFORMATION AND TELEPHONE LIST

AMBULANCE: Contact Control Room via Gaitronics or call 911

POLICE: Contact the Control Room via Gaitronics or call 911

FIRE: Contact Control Room via Gaitronics or call 911

CHAMBER:

USCG: New Orleans, Louisiana (504) 589-6225

HOSPITAL: Nemaha County Hospital - 402-274-4366 or Contact Control Room via Gaitronics or call 911

CNS PROJECT MANAGER/DESIGN ENGINEER: _____

SITE SAFETY: Industrial Safety Coordinator at Extension 5140/3313 or via Gaitronics

SECURITY: Contact CAS at Extension 5237 or via Gaitronics

MAINTENANCE SUPERVISION: Extension 5876/5437/5954 or via Gaitronics

WORK CONTROL CENTER: Extension 3302

DIVERS ALERT NET...(919)-684-8111

NOTES

1. DISCUSSION

1.1 APPLICABILITY/SCOPE

1.1.1 This procedure applies to all District and Contractor personnel involved in:

1.1.1.1 Conducting and/or supporting underwater diving operations at Cooper Nuclear Station (CNS).

1.1.1.2 Diving operations and/or support activities conducted in radiologically contaminated areas at CNS.

1.1.1.3 A Special Procedure shall be used where extreme radiation dose gradients could exist (i.e., fuel pool dives, etc.).

1.1.1.4 Underwater dive operations using a contractor's ITR-RDM approved document may be used in lieu of this procedure.

1.1.1.5 Over moving water work activities including working on surface craft.

1.2 The Job Supervisor having personnel working in areas described above, shall use Procedure 0.36, Hazardous Work Permits, to document safety precautions required.

1.3 DEFINITIONS

1.3.1 Above Moving Water - Refers to any work done where personnel would be working on a floating mobile craft or fixed structures over moving water hazards.

1.3.2 Bottom Time - The total elapsed time measured in minutes from the time when the diver leaves the surface in descent to the time that the diver begins ascent.

1.3.3 Cylinder - A pressure vessel for the storage of gases.

1.3.4 Dive Location - A surface or vessel from which a diving operation is conducted.

1.3.5 Dive Location Reserve Breathing Gas - A supply system of air or mixed gas (as appropriate) at the dive location which is independent of the primary supply system and sufficient to support divers during the planned decompression.

1.3.6 Dive Team - Divers and support personnel involved in a diving operation, including the designated Dive Team Supervisor.

1.3.7 Diver - An individual working in water using underwater apparatus which supplies compressed breathing gas at the ambient pressure.

1.3.8 Diving Mode - A type of diving requiring specific equipment, procedures, and techniques (SCUBA, surface-supplied air, or mixed gas).

1.3.9 SCUBA Diving - A diving mode independent of surface supply in which the diver uses open circuit self-contained underwater breathing apparatus. This type of diving shall only be used in an emergency situation.

1.3.10 Standby Diver - A diver at the dive location available to assist a diver in the water.

1.3.11 Surface-Supplied Air Diving - A diving mode in which the diver in the water is supplied from the dive location with compressed air for breathing.

1.3.12 Umbilical - The composite hose bundle between a dive location and a diver or bell, or between a diver and a bell, which supplies the diver or bell with breathing gas, communications, power, or heat as appropriate to the diving mode conditions, and includes a safety line between the diver and the dive location.

1.3.13 Heavy Gear - Diver-worn dress including helmet, drysuit, and weighted shoes.

2. REFERENCES

2.1 COMMITMENTS AND OBLIGATIONS MATRIX

COMMITMENTS AND OBLIGATIONS	AFFECTED STEPS
QAPD	Unvalidated

2.2 CODES AND STANDARDS

2.2.1 OSHA Standard 29CFR1910, Subpart T, Commercial Diving Operations.

2.2.2 OSHA Standard 29CFR1926.106, Working Over or Near Water.

2.3 PROCEDURES

2.3.1 Administrative Procedure 0.36, Industrial Safety Procedure.

2.3.2 Emergency Plan Implementing Procedure 5.7.24, Medical Emergency.

2.4 MISCELLANEOUS

2.4.1 SEN 225, Recurring Event, Diver's Umbilical Line Entangled in Service Water Pump.

2.4.2 SEN 245, Near Fatal Diving Incident in Circulating Water Discharge Vault.