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Project Non-Destructive Examination Procedure



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Project Non-Destructive Examination Procedure

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Project Non-Destructive Examination Procedure

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Project Non-Destructive Examination Procedure

1.0 PURPOSE

The purpose of this procedure is to provide minimum standards for Safe Work Practices and to be followed while conducting non-destructive examinations.

2.0 SCOPE

The scope of this procedure applies to all works performed under all Government Construction Contracts executed throughout the Kingdom of Saudi Arabia.

3.0 DEFINITIONS

Definitions	Description
OSHA	Occupational Safety and Health Administration
HSSE	Health, Safety, Security and Environment
JHA	Job Hazard Analysis
PPE	Personal Protective Equipment
WMS	Work Method Statements
STARRT	Safe Task Analysis and Risk Reduction Talk

4.0 REFERENCES

- OSHA 29 CFR 1910 Occupational Safety and Health Standards
- EPM-KSS-PR-000001 - Project General Safe Work Requirement Procedure
- EPM-KSS-PR-000003 - Project Personal Protective Equipment Procedure
- EPM-KSS-PR-000006 - Project Barricades and Signs Procedure
- EPM-KSS-PR-000007 - Project Confined Space Entry Procedure
- EPM-KSS-PR-000016 - Project Hazardous Work Permit Procedure

5.0 RESPONSIBILITIES

5.1 Project Manager

The Project Manager is responsible for ensuring the resources and arrangements are available for the implementation and management of this procedure.

5.2 Site Manager

Site Manager's responsibilities include the following:

- Overall responsibility for this procedure and for supporting this process and verifying all Project entities actively participate.
- Providing the personnel, facilities, and other resources necessary to effectively accomplish this Procedure.

5.3 Site Construction Manager

The Site Construction Manager is responsible for monitoring that the site is following applicable HSE requirements by:

- Providing the site-based resources to implement the requirements of this procedure.
- Communicating with Subcontractor Management concerning Project HSE expectations concerning General Safe Work Practices.



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- Providing leadership regarding HSE requirements and expectations for Managers, Project Supervisors, Superintendents and other leadership of the site execution staff.

5.4 Site HSSE Manager

Site HSE Manager's responsibilities include the following:

- Auditing this procedure
- Confirming that this Procedure meets the Local Regulatory requirements in the location of the Project facility.

5.5 Superintendent/Supervisors

Superintendent/Supervisors' responsibilities include the following:

- Being thoroughly familiar with this Procedure and the referenced Plans and Project-Specific Procedures.
- Being familiar with their individual responsibilities regarding the implementation and enforcement of the requirements in this document and the Plans and Procedures referenced herein
- Implement this procedure.
- Monitoring the work activities of personnel during the course of work, according to the applicable Standards and Procedures incorporated into the planning and execution of work.
- Ensuring that proper risk assessments are completed prior to tasks commence and again review when something changes. (e.g. Scope, process etc....)
- Conduct STARRT (Safe Task Analysis and Risk Reduction Talk) briefings prior to task with all involved personnel.

Correcting at-risk behavior and substandard conditions within their area of responsibility and administering disciplinary action to personnel who fail to follow the prescribed General Safe Work Practices.

6.0 RISK ASSESSMENT

An integral aspect of the work planning process is the performance of a proper risk assessment. Risk Assessments must be conducted at the Planning Stage to identify the hazard risks and determine control measures.

The Risk Assessments that shall be conducted at the Planning Stage are as follows:

- Project Risk Assessment.
- Work Method Statements (WMS)
- Job Hazard Analysis (JHA).
- Safety Task Analysis and Risk Reduction Talk (STARRT).

It is imperative that prior to beginning any work activity, a STARRT briefing occurs to discuss the contents of the WMS/JHA which includes mitigations for any other hazards noted by the crew at the jobsite. The discussion shall also include job steps, expected hazards associated with the activity, and the mitigation and protection methods that shall be implemented to prevent incidents.

The Hierarchy of control shall be used to reduce the likelihood of an incident occurring.

- **Elimination** (Remove the Hazard)
- **Substitution/Isolation** (Replacing material, process or hazard with a lower risk one/separate people from the hazard, use suitable guarding, distance, etc.)
- **Engineering Controls** (Redesign or replacement of plant and equipment)
- **Administration Controls** (Procedures, training, signage)
- **PPE - PERSONAL PROTECTIVE EQUIPMENT**



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No work is to commence until the above has been implemented and signed by the relevant Supervisor in charge.

7.0 GENERAL

7.1 Non-Radiographic Testing/Examination

When performing testing and inspection on tanks, lines, or vessels in operational areas, the following will be the general policy:

- Equipment that has self-contained power such as ultrasonic testing equipment will require a work permit.
- Magnetic particle inspection devices of the electric plug-in type, will require a work permit.
- Any onsite nondestructive testing (non-radiography) must be reviewed with the HSE Department prior to use.

Non-radiographic testing/examination methods may involve the use of solvents and pressurized spray cans. It is essential that adequate ventilation is provided in the work area particularly when working in confined spaces.

7.2 Radiographic Testing/Examination

A risk assessment must be conducted to identify any uncontrolled risk and arrange for the risks to be controlled (for example, adequate access including escape routes, fall prevention, and lighting).

Where access is required into a confined space, the responsible Supervisor will initiate the application for a confined space entry permit.

Authorization will be contingent on the following:

- Exact Location.
- Start and finish time.
- Adjacent Operations.

When authorization has been granted, the responsible Supervisor will notify all other affected contractors at least 12 hours in advance of work start.

The Contractor will inspect the work area and when satisfied that risks have been controlled, will sign the Hazardous Work Permit indicating full understanding of all precautions to be observed prior to commencement of radiography.

7.2.1 Barricades/Exclusion Zone

The Contractor will erect barriers (yellow and black tape), warning signs, and flashing lights around the area and check to ensure that all personnel have been vacated from inside the barriers. The distance of the barriers will differ depending on local requirements.

7.2.2 Requirements

Where radiography is being performed, the following information must be available at the Project/Facility:

- Applicable licenses.
- Operating and emergency procedures.
- Record of leak test.
- Record of latest radiological survey instrument calibration.
- Notice to employees.



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- Appropriate shipping papers.

Subcontractor must carry an identification card, showing the individual's classification level and the type of nondestructive testing disciplines for which the subcontractor is qualified.

Radiographic work is subject to audit by the Project.

Appropriate device hazard labeling will be employed.

A wind-out test may be required at the discretion of the HSE Supervisor to ensure that barriers have been erected at a safe distance per the jurisdiction standard.

When the above preparation has been carried out the radiography may proceed.

7.2.3 General Work Practices

Only a trained radiographer may operate the radiographic exposure devices.

While the radiographic work is being performed, the radiographer must determine, by calculation and by use of a calibrated survey meter, the areas around the radiation source that would be unsafe for personnel entry (a safe area will not exceed more than two millirems.) This area must be posted in accordance with applicable regulatory requirements. Safe areas should be restricted by physical barriers or using an observer.

The radiographic exposure devices and storage containers will be locked and physically secured, to prevent tampering, unauthorized removal, and accidental exposure when not in use.

After each radiographic exposure, the radiographer will ensure that the sealed source is returned to its shielded position and secured in that position.

Each radiographer and radiographer's assistant must wear a direct reading pocket dosimeter and a film badge or chemiluminescent dosimeter at all times during a radiographic operation.

A pocket dosimeter must be capable of measuring doses from 0 to 200 millirems and must be recharged daily or at the start of each shift. Radiographic operations must cease if the pocket dosimeter goes off-scale and emergency procedures must be implemented.

A pocket dosimeter must be read daily and a record of daily doses must be maintained.

Film badges or thermoluminescent dosimeters must be processed for dose assessment no less than quarterly, and immediately if an individual's pocket dosimeter is discharged beyond its range.

A detailed log for each radiographic exposure must be maintained.

On completion of the work, the Contractor will return the source to its storage area and remove all barriers and equipment.

The Radiography Application will be returned to the responsible supervisor who will keep a file of all Radiography Applications.

7.3 Emergency Response

All contractors involved in the use of ionizing radiation shall prepare formal contingency plans to deal with any emergency that might arise from the storage, transportation or use of ionizing radiation.

At all times, the contractor will carry tools and protection equipment for managing emergencies to ensure the containment of the radiation source.



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In an emergency, all radiographic testing must cease and the source protected and secured.

If a person enters a barricaded area while testing is in progress, the radiographer must cease operations immediately and contact the HSE Department and Supervisor. The person should be identified and detained to determine potential exposure levels. Test teams failing to report barricade violations will be subject to disciplinary action.

As a minimum, the Emergency Plan shall include, but not be limited to dealing with the following emergencies:

- Accidental overexposure to ionizing radiation.
- Loss or theft of a source of ionizing radiation.
- Vehicular accident involving transport of sources of ionizing radiation.
- Accidental separation of a chemical source from its shielding.
- Physical damage to a sealed source, causing possible leakage of radioactive material.
- Contamination of the environment with radioactive material.

All users of ionizing radiation shall have available at all times means of contacting their Radiation Protection Supervisor and emergency services.

All emergency incidents shall be reported to the Construction Manager and the HSE Supervisor.

7.4 Permit to Work Requirements

Nondestructive examination activities shall be performed under a Hazardous Work Permit. The specific form to be used for this purpose shall be described in the Project's HSE Execution Plan.

The permit identifies key information relevant to the task to be performed and appropriate control measures to be exercised by the competent person in charge of the task.

The Permit to Work also consists of key information relevant to the task, including:

- Requester/Application.
- Permit Number.
- Area.
- Exact Location.
- Application Date.
- Scheduled Start/Completion Dates.
- Source Number.
- Container Number.
- Source Size.
- Area Authorization.
- Hazards.
- Special Controls.
- Associated Work Permit Numbers.
- Method Statement Section.
- Permit Signatures.
- Requestors & Task Supervisors Acceptance.
- Permit Close Out.

8.0 ATTACHMENTS

1. Nondestructive Examination Process Flow Chart



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Attachment 1 - Nondestructive Examination Process Flow Chart

