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PETRONAS

BLANKING AND BLINDING FRAMEWORK

PETRONAS ENERGY CANADA LTD.

DOCUMENT AUTHORIZATION

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Review and Revision Record

List of Document Revisions

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2.1	July 26, 2023	July 26, 2023	Paul Gould	Minor revisions throughout document.

Change Management Process

If there is a deviation or other comments regarding this document, contact the Document Owner

1. Summary Statement

The Blanking and Blinding Framework defines the requirements for the blanking, blinding or disconnecting of piping systems, equipment and vessels. The aim is to prevent harm to people, and damage to equipment or the environment, which will support the implementation of the Health, Safety and Environment Policy.

2. Objectives

The objectives of this Framework are to:

- Provide an overview of the process for blanking, blinding or disconnecting activities;
- Provide the step by step procedure for both the installation and removal of blanks, blinds or disconnects;
- Outline roles and responsibilities related to blanking, blinding or disconnecting;
- Outline competencies for blanking, blinding or disconnecting; and
- Outline the process measurement criteria.

3. Scope

This Framework applies to all Employees, Contractors and Consultants. It applies to all business activities of the Company where blanking, blinding or disconnecting is required to ensure safe isolation of piping systems, equipment and vessels.

4. Definitions

Capitalized terms used herein have their meanings set forth in the Master Glossary.

5. Requirements

5.1 Overview

This framework outlines the sequential steps in the process to be used for the physical blanking, blinding or disconnecting of piping and flanges to ensure that Workers are not exposed to trapped pressure when breaking integrity to perform work activities.

Blanking, blinding and or disconnecting must be carried out for all confined space entry activities and wherever a Job Hazard Assessment deems that the safest way to perform work on equipment is achieved through the blanking, blinding or disconnecting process.

5.2 Blanking and Blinding Procedure

5.2.1 Blanking and Blinding Installation Procedure

The scope of this procedure is to identify the steps required for the safe installation of blanks, blinds or disconnects for work to be performed. The sequential steps must be followed to ensure all hazards have been identified and mitigated prior to the installation of the blanks or blinds.

5.2.1 Blanking and Blinding Removal Procedure

The scope of this procedure is to identify the steps required for the safe removal of blanks, blinds or disconnects after work has been completed. The sequential steps must be followed to ensure all hazards have been identified and mitigated prior to the removal of the blanks or blinds.

5.3 Installation of Blanks, Blinds or Disconnects

5.3.1 Developing a Blanking and Blinding Work Plan

The Worker (Employee, Consultant) must fill out a Blanking and Blinding Work Plan Form based on the work activity to be performed.

The Blanking and Blinding Work Plan Form must include:

- Sign off and date of approval prior to any work activity commencing
- Approval of the developed Blanking and Blinding Work Plan by any one of the following PECL representatives:
    - Supervisor;
    - Lead Operator;
    - Level 1 Operator;
    - Steam Chief; or
    - Technical Advisor
- The facility name and location (NTS/LSD) associated to the Blanking and Blinding Work Plan Form;
- The equipment name and description of the equipment where the blanks, blinds or disconnects are to be installed;
- The tag number associated to each blank, blind or disconnect point;
- A descriptor of where the blanks, blinds or disconnects are installed;
- A copy of the associated Piping and Instrumentation Drawings (P&IDs);
- The size of the line to be disconnected;
- The sizes of line spacer and flange size for the blank and or blind;
- The blank and or blind type;
- The pressure rating of the blank and or blind to be installed;
- If the blank, blind or disconnect location is insulated or heat traced;

- If the blank, blind or disconnect location requires scaffold to be installed;
- Blank, Blind or disconnect Installation Verification by Operator and Worker; and
- Blank, blind or disconnects Removal Verification by Operator and Worker.

Where blanking and blinding activities are to be carried out for maintenance activities, the PECL Worker overseeing the blank, blind or disconnect activities cannot be the one to create and approve the Blanking and Blinding Work Plan Form. The Blanking and Blinding Work Plan Form must be reviewed and approved by a second competent PECL representative as noted above.

5.3.2 Installation of Blank, Blind or Disconnect Tags

The operator who prepared the BB Plan must install tags at each location where blanks, blinds or disconnects are used coinciding with the Blanking and Blinding Work Plan Form. As the BB or disconnect is carried out the installed, tags attached to the flanges must be removed and re-attached to the blank and blind handles and at disconnect location.

5.3.3 Blank and Blind Selection

All spec blanks and pressure rated blinds must be stamped with the correct pressure rating for the piping, equipment or vessel being isolated, in accordance with manufacturer recommendations. In cases where isolation blinds are being installed downstream of existing pressure-rated blind locations (e.g. battery limits), non-pressure rated spade, paddle, or blinds may be used following the completion of a Job Hazard Assessment Form in accordance with the Work Site Management Framework.

5.3.4 Requirements for Vented Blinds

When planning to install or remove all types of blanks, blinds or disconnects, consideration must be given to ensuring that there is a method in place to verify zero energy before the installation or removal of any blanks, blinds or disconnects. If there is no existing vent point upstream and/or downstream of the blind, the blind must be pressure rated, tapped and a bleed valve installed prior to installation. All vented blinds will be clearly identified which side is vented.

5.3.5 Isolation Assessment

The Permit Issuer must complete an Isolation Assessment walk down with all Workers who are installing the blanks, blinds or disconnects to identify hazards and to verify a zero energy state prior to the commencement of the work activities. The walk down must be documented and signed off utilizing the Isolation Assessment Form in accordance with the Work Site Management Framework.

5.3.6 Job Hazard assessment

The Permit Receiver must conduct a Job Hazard Assessment to identify hazards, and appropriate isolation devices that may be required for the work activity. The JHA is conducted with all Workers working on the isolated equipment. This process must follow the Work Site Management Framework and the Permit to Work Framework.

5.3.7 Issuing Permit to Work for Installation of Blanks, Blinds or Disconnects

The Permit Issuer will:

- Issue a PTW for the installation of the blanks, blinds or disconnects in accordance with the Permit to Work Framework. A copy of the Blanking and Blinding Work Plan Form complete with marked up P&IDs or approved schematics, where available, will be attached to the Permit to Work.

The Worker(s) installing blanks, blinds or disconnects will use the working copy of the Blanking and Blinding Work Plan Form for the installation of the blanks, blinds or disconnects, and will return the working copy of the Blanking and Blinding Work Plan Form, to the Permit Issuer.

The Worker(s) installing the blanks, blinds or disconnects must:

- Ensure that prior to the installation of blanks, blinds or disconnects, a Lockout Tagout process is completed in accordance with the Lockout Tagout Framework;
- Wear appropriate Personal Protective Equipment (PPE) in accordance with the Personal Protective Equipment Technical Standard and the Exposure Control Planning Framework;
- Receive a Permit to Work for the installation of the blanks, blinds or disconnects. A working copy of the Blanking and Blinding Work Plan Form complete with marked up P&IDs or approved schematics, where available, will be attached to the PTW.
- Ensure blanked, blinded or disconnected equipment that requires entry by personnel for Confined Space work, is conducted in accordance with the Confined Space Entry Framework;
- Confirm that associated piping and equipment to be worked on is isolated, depressurized and ventilated;
- Ensure that tags attached to the flanges are removed and re-attached to the blank and blind handles and at disconnect location coinciding with the working copy of the Blanking and Blinding Work Plan Form As they are installed; and
- Record installation of blanks, blinds or disconnects on the Blanking and Blinding Work Plan Form when all blanks, blinds or disconnects have been installed. The signed working copy of the Blanking and Blinding Work Plan Form must be returned to the Permit Issuer with the PTW.

If required to prevent leakage, gaskets must be installed on the pressure side of blanks or blinds, and flanges must be tightened to ensure the blanks or blinds are effective.

5.3.8 Verifying Blank and Blind Installation

The Permit Issuer and Permit Receiver will review the installation of the blanks, blinds and disconnects in the field. The Permit Issuer and Permit Receiver will date and initial the master copy of the Blanking and Blinding Work Plan Form verifying installation of blanks, blinds or disconnects, and file the completed blind plan.

5.4 Removal of Blanks, Blinds or Disconnects

5.4.1 Isolation Assessment

The Permit Issuer must complete an isolation assessment walk down with all Workers who are removing the blanks or blinds and reconnecting piping to identify hazards and to verify a zero energy state prior to the commencement of the work activities. The walk down must be documented and signed off utilizing the Isolation Assessment Form in accordance with the Work Site Management Framework.

5.4.2 Job Hazard Assessment

The Permit Receiver must conduct a Job Hazard Assessment to identify hazards, and appropriate isolation devices that may be required for the work activity. The JHA is conducted with all Workers working on the isolated equipment. This process must follow the Work Site Management Framework and the Permit to Work Framework.

5.4.3 Removal of Blanks, Blinds and Reconnection of Piping

The Permit Issuer will:

- Issue a Permit to Work for the removal of the blanks or blinds and the reconnecting of the piping in accordance with the Permit to Work Framework. A working copy of the Blanking and Blinding Work Plan Form complete with marked up P&IDs or approved schematics, where available, will be attached to the Permit to Work.

The Worker(s) removing blanks or blinds and reconnecting piping will utilize a working copy of the Blanking and Blinding Work Plan Form when removing blanks, blinds and reconnecting piping and will return the working copy of the Blanking and Blinding Work Plan Form, along with all the blind tags to the Permit Issuer.

The Worker(s) removing the blanks, blinds or reconnecting piping must:

- Ensure that prior to the removal of blanks, blinds or disconnects, a Lockout Tagout process is completed in accordance with the Lockout Tagout Framework;
- Wear appropriate Personal Protective Equipment (PPE) in accordance with the Personal Protective Equipment Technical Standard and the Exposure Control Planning Framework;
- Receive a PTW for the removal of the blanks, blinds or disconnects. A working copy of the Blanking and Blinding Work Plan Form complete with marked up P&IDs or approved schematics, where available, will be attached to the PTW.
- Confirm that associated piping and equipment to be worked on is isolated, depressurized and ventilated;
- Remove tags at each location where blanks, blinds or disconnects are in place coinciding with the working copy of the Blanking and Blinding Work Plan Form; and
- Record removal of blanks, blinds or disconnects on the Blanking and Blinding Work Plan Form when all blanks, blinds or disconnects have been reinstalled. The signed working copy of the Blanking and Blinding Work Plan Form must be returned to the Permit Issuer with the PTW.

5.4.4 Verifying Blank, Blind Removal and Reconnection of Piping

The Permit Issuer and Permit Receiver will review the removal of the blanks and blinds and reconnecting of the piping in the field and date and initial the master copy of the Blanking and Blinding Work Plan Form verifying the removal of blanks, blinds and installations of piping disconnects, and file the completed Blanking and Blinding Work Plan Form. Blind tags will be returned for future use.

5.5 Blank, Blind or Disconnect Tracking

Blanks, blinds or disconnects installed or removed for maintenance activities or used for confined space entry will be tracked using the Blanking and Blinding Work Plan Form, blind tags, and marking on the P&IDs or a schematic where available that is approved by the Site Supervisor.

5.6 Roles and Responsibilities

The identification and isolation of harmful substances, which may be a hazard to personnel, is the responsibility of those involved in work planning activities carried out under the Work Site Management Framework.

5.6.1 Permit Issuer

The Permit Issuer is assigned by Management and those in a supervisory capacity.

The Permit Issuer's responsibilities are as follows:

- Coordinating all activities of all workers relating to blanking, blinding or disconnection of piping, equipment or vessels including confirming that effective isolation proving zero energy from potentially harmful substances has been established;
- Identifying and communicating sources of potentially harmful substances that require blanking, blinding or disconnecting prior to starting the planned work;
- Creating the Blanking and Blinding Work Plan Form and getting approval from a PECL representative as per section 5.3.1.
- Carrying out all necessary isolation procedures;
- Ensuring all necessary equipment is prepared;
- Attaching blind tags to flanges or disconnection points;
- Verifying that isolation requirements identified in the Blanking and Blinding Work Plan Form have been implemented by walking down the jobsite with all workers involved in the job task prior to issuing a PTW and documenting on the Isolation Assessment Form in accordance with the Work Site Management Framework;
- Leading the tailgate safety meeting, and completing the Tailgate Safety Meeting Form in accordance with the Work Site Management Framework;
- Reviewing the contents of the Job Hazard Assessment as per the Work Site Management Framework;

- Verifying that blanking, blinding or disconnecting isolation requirements identified in the Blanking and Blinding Work Plan Form have been implemented prior to issuing a Permit to Work for both the removal and installation of blank, blinds or disconnecting of piping;
- Verifying that all individuals involved in the work activities understand the contents of the Blanking and Blinding Work Plan Form;
- Verifying through active monitoring that the requirements of this Framework are complied with during work activities; and
- Stopping all work if the requirements of this Framework are not being followed or if there is a failure of any of the installed devices

5.6.2 Permit Receiver

The Permit Receiver's responsibilities are as follows:

- Leading and or participating in the Job Hazard Assessment in accordance with the Work Site Management Framework;
- Participating in the isolation assessment walk down, and reviewing the completed Isolation Assessment Form;
- Receiving the Permit to Work in accordance with the Permit to Work Framework;
- Following the blanking, blinding or disconnecting requirements detailed in this Framework to properly carry out the installation and removal of blanks, blinds or disconnects; and
- Stopping all work and informing the Permit Issuer if the requirements of this Framework are not being followed or there is a failure of any of the installed devices.

5.6.3 Worker

The Worker(s) responsibilities are as follows:

- Participating and or leading the Job Hazard Assessment in accordance with the Work Site Management Framework;
- Participating in the isolation assessment walk down, and reviewing the completed Isolation Assessment Form;
- Following the requirements of the JHA, Framework, and Permit to Work;
- Installing and removing blanks, blinds or disconnects as identified in the Blanking and Blinding Work Plan Form; and

Stopping all work if the requirements of this Framework are not being followed or if there is a failure of any of the installed devices.

5.7 Competency

All personnel will receive training appropriate to the roles they are required to fill. Training provided will include an assessment of competency to complete the physical blanking, blinding or disconnecting of piping and flanges. Competency will be assessed in accordance with the Operations Competency Technical Standard.

5.7.1 Permit Issuer

The Permit Issuer training will include the following:

- The requirements of this Framework, the Lockout Tagout Framework, Work Site Management Framework, and the Permit to Work Framework;
- The requirements on how to complete the Job Hazard Assessment Form, Blanking and Blinding Work Plan Form, Isolation Assessment Form, PTW and the Blanking and Blinding Verification Form;
- Reading and understanding of technical documents including Piping and Instrumentation Drawings (P&IDs) or approved schematics where available;
- The specific types and magnitude of potentially harmful substances encountered in the workplace; and
- The means of controlling and isolating potentially harmful substances.

Training provided will include an assessment of competency to implement effective isolation of potentially harmful substances when blanking, blinding or disconnecting.

5.7.2 Permit Receiver

The Permit Receiver's training will include the following:

- The regulatory requirements for isolation including lockout Tagout, and blanking, blinding and disconnecting;
- Understanding and knowledge for the reading of P&IDs and schematics where available;
- Participating in and or leading the Job Hazard Assessment in accordance with the Work Site Management Framework;
- Participating in the isolation assessment walk down, and completing the Isolation Assessment Form;
- Following the requirements as laid out in the Job Hazard Assessment Form and Permit to Work are being met;
- The requirements for the specific work activity to be performed;
- The specific types and magnitude of hazardous energy encountered in the workplace; and
- The means of controlling and isolating that energy.

5.7.3 Worker

The Worker's responsibilities are as follows:

- Participating in the Job Hazard Assessment in accordance with the Work Site Management Framework;
- Participate in the isolation assessment walk down, and reviewing the completed Isolation Assessment Form;
- Following the requirements as laid out in the Job Hazard Assessment Form and Permit to Work;
- The specific types and magnitude of hazardous energy encountered in the workplace;
- The means of controlling and isolating energy; and
- The requirements for the specific work activity to be performed.

5.8 Process Measurement Criteria

5.8.1 Assurance Activities

The Blanking and Blinding Verification Form is used as a self-assessment tool for managing conformance to this framework in accordance with the HSSE Assurance Framework.

5.8.2 Performance Indicators

Performance will be managed in accordance with the HSSE Performance Management Framework.

Assessment Category	Required performance indicators
Planning	• Monthly total site number and percentage (suggested target of +5%) of Blanking and Blinding Work Plan reviewed for quality; and • Monthly total site number and percentage of quality improvement opportunities identified from Blanking and Blinding Work Plan quality reviews.
Execution	Percentage compliance with Blanking and Blinding Work Plan requirements