



JOSOP 407 — Bypassing Critical Protections Standard

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1.0 Purpose, Objectives and Scope

1.1 Purpose

The purpose of this standard is to ensure that bypassing of critical protections is performed in a safe and controlled manner.

1.2 Objective

This standard establishes the requirements for the safe performance of the necessary bypassing of critical protections.

NOTE: Each Global Upstream strategic business unit (SBU) or location may have additional regulatory requirements.

1.3 Scope

This Bypassing Critical Protection Standard covers work performed by JO employees and their delegates and contractors within JO operational control.

This standard is applicable to plant/platform critical protective devices or systems where it is possible to apply a hardware or software bypass, force, inhibit, override, or their electrical equivalent.

This standard does not apply to the following:

- When the purpose of the bypass is for Lockout/tagout. For lockout/tagout, please see JO – Isolation of Hazardous Energy Standard.
- “Startup overrides” designed with automatic removal after a specified time delay
- Permanent bypasses, the application of bypasses that change the basis of design as it relates to safety and/or critical protections that are already properly isolated, must be managed under the *JO - Management of Change Process* and/or the *JO - Isolation of Hazardous Energy Standard*.

NOTE: This system is not intended to replace the Isolation of Hazardous Energy Standard. However, on occasion it may be used in conjunction with the Isolation of Hazardous Energy Standard.

2.0 Requirements

1. Personnel involved in the authorization, approval, and implementation of bypassing critical protections shall be trained and competent in the roles for which they are responsible.
2. Hazards involved with bypassing critical protections for maintenance or testing, planned or unplanned, must be assessed, and alternative protections must be identified.
3. Bypassing, isolating, or removing critical protections during upset/abnormal operating conditions in order to maintain production is strictly forbidden.
4. Only a minimum number of critical protective devices shall be bypassed at a time. There shall be at least one other layer of protection whenever a critical protection is on bypass.
5. Facility management shall conduct periodic audits and verifications to ensure compliance to this standard.

3.0 Terms and Definitions

The following terms and definitions apply to the JO – Safe Work Practice (SWP) – Bypassing Critical Protections:

Bypass - To temporarily block out, isolate, override, inhibit, force, jumper, or disable a device or system so that it will not perform its designed function for the purpose of testing, maintenance and startup.

NOTE: For the purpose of this standard, the words “bypass,” “isolate,” “override,” “inhibit,” “force,” “jumper,” “block,” “disable” or any other term used to describe the temporary act of disabling a critical protective device or system have the same meaning.

Critical Protections - Devices or systems designed to protect personnel, the environment, process, equipment and properties from an undesirable event. Functional critical protections are a vital component of safety systems. They are designed and installed to ensure safe, reliable and environmentally sound operations. Critical protections consist of hardware and software which include, but are not limited to, the following:

- Shutdown devices or systems such as Pressure Safety Low Low (PSLL), Pressure Safety High High (PSHH), Emergency Shutdown (ESD) valves, etc.
- Fire and gas detection and fire suppression devices such as fire pumps, deluge systems, fusible loops, CO₂ fire extinguishing systems, etc.
- Pressure Safety Valve (PSV), Blowdown Valve (BDV) and associated valves
- Safety critical manual valves that are (normally) locked open or closed
- Equipment safeguards, overspeed trip, fired equipment flame detectors and similar safety systems

Effective Monitoring - Effective monitoring is, in effect, taking the place of the critical protections. An individual must be able to manually provide the same level of protection as the bypassed critical protection(s) in a timely manner in order to prevent an undesirable event. (Leaving the area for breaks, parts, supplies or tools would compromise effective monitoring.)

Flag/Tag - A hanging, removable placard that identifies the status of a critical protection device. Tags should only be used on bypassed or temporarily out-of-service devices or components.

In-Service - The device or component is performing its designed function.

Layers of Protection (LOPs) or Lines of Defense (LODs) - Measures for prevention and mitigation of major accidents. These LOPs serve either to prevent an initiating event from developing into an incident, or to mitigate the consequences of an incident once it occurs.

Maintenance - Adjustments or repairs, typically for a short duration (e.g., 15 minutes), that can be performed without compromising effective monitoring.

Out-of-Service - A device or component is out-of-service (OOS) when it is not being used to perform its intended function, and it is properly isolated by the use of the JO Isolation of Hazardous Energy SWP standard.

Properly Isolated Protection - Protective devices or systems that are properly isolated or disconnected by means of positive isolation; for example, a blind flange to prevent transfer or communication of any fluids.

Qualified Person - A person who has successfully completed a production safety system training program and who is familiar with the site-specific monitoring procedures of that facility. Any person who has not received the required training must be directly supervised by a qualified person when engaged in installing, testing, inspecting, flagging, bypassing, monitoring or maintaining critical protections.

Remote Site - Satellite or subordinate offshore platform that is not bridge-connected to the parent facility, or an onshore site that is controlled remotely by its parent facility using SCADA (Supervisory Control and Data Acquisition).

Remote Monitoring - Monitoring of operating parameters on a remote site by a qualified person at a central location by means of a telecommunications system such as SCADA.

Startup - The period of time required for the production process to stabilize while resuming normal operations.

Testing - The process of validating the set point and/or functionality of a device or system.

Temporarily Out-of-Service - A component is temporarily out-of-service when it is in standby, shutdown or not-in-use mode, but when needed, can easily be returned to service. These components are NOT isolated from production facilities.

4.0 Roles, Responsibilities and Training Requirements

There must be clearly defined roles, and personnel must meet the training and competency requirements of this standard prior to starting work. JO is responsible for establishing the methodology to achieve competence.

When selecting personnel for these positions, consideration should be given to their level of experience and their past performance.

The following roles and responsibilities are specific to Bypassing Critical Protections and are further defined in the JO –Training Requirements Tool:

- Qualified Person
 - Ensure effective monitoring and layers of protection are in place when bypassing systems
 - Monitoring of operating parameters on a remote site
 - Utilize management of change process when appropriate
 - May participate in hazard analysis and identification of controls to be implemented to eliminate or minimize risk
 - Partakes in post-job debrief if required
 - Ensures competent personnel perform required functions
 - Stops the work if unsafe conditions develop

For updates refer to [JO_MSW_TrainingRequirementsTool.doc](#)

4.1 Initial Training

Personnel must meet the competency requirements of this standardized safe work practice prior to starting work. Refer to the [JO – Training Requirements Tool](#).

4.2 Refresher Training

Refresher training must be provided as follows:

- As required by applicable regulations or JO policy
 - As needed when identified by verification, inspections, incidents or audits.
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5.0 Standard Instructions

When considering work that involves bypassing critical protection devices, always consider whether there is a viable alternative to performing a bypass while equipment, operations or process is shut down.

5.1 Bypassing Steps

The following steps should be followed when placing a critical protection device in bypass:

1. Identify critical protection devices to be temporarily bypassed
2. Obtain approval to bypass devices
3. Flag devices to be bypassed
4. Perform bypass
5. Monitor the bypassed or blocked-out functions
6. Complete startup, shutdown, operation, maintenance, or testing activities
7. Return critical protective device or system to normal service, and verify functionality
8. Check/verify work completion and notify affected personnel before removing the bypasses and flags

5.2 Assessing and Managing Hazards

Bypassing critical protections must be managed in accordance with the *JO – Managing Safe Work Process* and the JO Permit to Work Standard.

NOTE: For longer term bypasses, the *JO – Isolation of Hazardous Energy Standard* and *JO – Management of Change Process* should be consulted.

A hazard analysis shall be conducted to assess the potential consequences and effects prior to the application of bypasses, inhibits/overrides, force, or disable. This includes the use of any bypass that is required for plant startup that does not time out or that reverts to a live state when the plant returns to normal operating condition.

A hazard analysis that has previously been used for this purpose may be used again, providing it has been reviewed, updated and signed off as current.

A completed hazard analysis may indicate that the override, inhibit or force may not safely be applied, or that further, detailed hazard analysis is required in consultation with other subject matter experts (SMEs).

5.3 Bypass Administration and Controls

5.3.1 Layers of Protection

Layers of protection shall be considered before bypassing any critical protection device or system. The minimum number of layers of protection for any initiating event at any time must be maintained when bypassing critical protection devices or systems.

The hierarchy of the layer of protection must start with the design (inherent safety). Assuming the design of the equipment meets JO standards, the next layer of protection to be considered is control.

5.3.2 Minimizing Personnel and Critical Protection Devices in Bypass at Any One Time

Only the minimum number of critical protection devices shall be bypassed at any one time.

The number of personnel who monitor protection devices in lieu of automatic protection shall be kept to an absolute minimum. Any person asked to perform the function of a critical protection device while that protective device is in bypass shall know and understand the procedures regarding this type of monitoring.

If the requirements of section [5.2 Assessing and Managing Hazards](#) are met, protective devices or systems may be bypassed to allow startup, maintenance or testing tasks to be performed.

Although it may be convenient to override extra critical protection devices to prevent nuisance shut-ins or to use “group override,” use of such group devices is not permitted.

As soon as the task is completed, the protection device must be placed back in service. Remove the flag/tag and notify the affected personnel.

5.3.3 Identifying Bypassed Critical Protection Devices

Critical protection devices that have been bypassed must be identified by a bypass flag or tag at the bypass or isolation point.

JO/facility shall identify bypassed critical protection devices or systems by a minimum of two identification methods. Two of these three may be used in any combination: bypass register, flagging, and/or bypass display board.

Critical protection devices and systems which are temporarily out of service shall be tagged “temporarily out of service.” These flags or tags shall be fitted to the devices being bypassed where they are located, such as at the local control panel, isolation valve, etc.

The purpose of a flag or tag is to be a visual reminder/alert to personnel that a critical protection is in bypass.

5.3.3.1 Personal Tags

A sufficient number of bypass flags/tags shall be provided to each qualified person. These flags/tags should be accounted for at the end of each work shift. This requirement has the following benefits:

- Provides immediate availability of flags/tags
- Provides built-in compliance so that only a minimum number of devices may be bypassed

- Serves as a reminder to the qualified person to review the day’s work and account for flagged devices placed on bypass

5.3.3.2 Bypass Tag Display Board

Bypass tag display board(s) may be used as another means of control and communication. The board should be located at each facility in the control room or at the panels, whichever location is deemed more effective by the workgroup.

The bypass tag display board provides the following advantages:

- Flags are readily accessible any time a critical protection device or system needs to be bypassed.
- Tag display boards visually alert personnel that a critical protection device or system is on bypass if a flag/tag is missing from its hanger.
- The tag display board serves as a reminder to personnel to review the day’s work and to account for flagged critical protection devices or systems placed on bypass.

5.3.3.3 Bypass Register

Bypass register(s) may be used as another means of control and communication. The register should be located at each facility in the control room or at the panels, whichever location is deemed more effective by the work group. A sample bypass register is provided in [Appendix A: JO Critical Protection Bypass Register](#).

The bypass register provides the following advantages:

- The register serves as a reminder to personnel to review the day’s work and to account for flagged critical protection devices or systems placed on bypass.

5.3.3.4 Secondary Flagging

A secondary flagging device shall be installed on the front of an auxiliary control panel so that it is clearly visible if the condition or operating mode of a bypassed critical protection device cannot easily be seen (i.e., devices/isolation valves are inside a control panel, slave panels, plugged relay ports, on a boat landing ESD, etc.).

5.3.4 Monitoring of Operating Conditions/Parameters

5.3.4.1 Site-Specific Monitoring

Any critical protection device on a piece of equipment that does not have an equal and redundant device to detect the same condition shall be continually monitored by a qualified person(s) at the location while the device is in bypass.

When a qualified person is monitoring a bypassed critical protection device, he or she is taking the place of the critical protection device, and must be able to manually provide the same level of protection as the critical protection device in a timely manner to prevent an undesirable event. Qualified personnel shall monitor the bypassed or blocked-out functions until the critical protection device or system is placed back in service.

The area controller at the location shall determine the process, procedures, and number of personnel required to provide effective monitoring for each critical protection device or system that is placed in bypass. Effective monitoring can be conducted by one individual on more than one critical protection device in the same

general area, provided the person can freely move around the general area of production equipment and effectively monitor more than one process simultaneously.

Qualified persons who are bypassing critical protection devices or systems will be responsible for answering the following questions:

- What is the process variable to be monitored?
- What device will be used to monitor the process variable?
- How will the process be controlled?
- At what point must the qualified person react to prevent an undesirable event?
- Will this procedure provide the same level of protection as the critical protection device?
- How many people are required to effectively monitor the bypassed system/equipment?

NOTE: It is not necessary to monitor the bypassed critical protection device or system function which has been placed out-of-service. However, the pressure safety valve on any out-of-service component must be left in service, maintained, and tested in accordance with company policy or applicable regulatory requirements.

5.3.4.2 Remote Monitoring

On some occasions, there may be a need to bypass critical protection devices or systems, and monitor the operating parameter using the Supervisory Control and Data Acquisition (SCADA) system. The only time that bypassed critical protection devices or systems may be remotely bypassed and monitored is when all of the following conditions are met:

- The SCADA control operator must place the critical protection device or system on bypass only as part of a reset or startup activity.
- Radio communications must be maintained at all times between the person at the remote location and the SCADA control operator.
- The SCADA control operator may only monitor a minimum number of critical protection devices. If multiple critical protection devices or systems are to be monitored, the SCADA control operator must be able to view the appropriate data on one SCADA screen.
- The bypassed critical protection device or system must be returned to service immediately after it has been cleared and the process has stabilized.
- **Remote monitoring of mechanically disabled critical protection devices or systems (e.g., “pinning” a pneumatic relay) is not allowed.**
- Other site-specific guidelines may be required. These should be documented and maintained at the remote control facility.

5.4 Monitoring and Audit

Routine monitoring and auditing shall be conducted to ensure that this standard is being applied properly.

The supervisor responsible for the work area shall monitor and conduct periodic audits to review the integrity of the bypassing procedure. [Appendix B: JO Critical Protections Bypass Audit Sheet](#) may be used.

6.0 Records

6.1 Required Records

The following records will be kept:

- Copies of permits and associated documentation shall be maintained in accordance with the JO Permit to Work Standard.

6.2 Retention Requirements

Documentation shall be retained as required by local regulation, JO policy, or for a minimum of six months, whichever is greater.

7.0 References

Table 1. Document List

Title	File Name
JO – Training Requirements Tool	JO_MSW_TrainingRequirementsTool.doc
JO – Isolation of Hazardous Energy Standard	JO_MSW_IsolationofHazardousEnergy Standard.doc

8.0 Other Guidance Documents

Table 2. Document List

Title	File Name
American Petroleum Institute (API) Recommended Practice (RP) 14-C, Safety Analysis for Production Platforms	American Petroleum Institute (API)

9.0 Document Control

Table 1: Document Control Information

Description	GU Common	SBU-Specific
Approval Date	27 February 2008	17 December 2008

Description	GU Common	SBU-Specific
Next Revision Due	27 February 2011	<i>17 December 2011</i>
Control Number		

Table 2: Document History

Version Number	Date	Notes
1.0	27 February 2008	Initial Release
1.1	8 December 2008	Added bookmarks for OE Mentor
1.1.1	17 December 2008	SAC Adoption of MSW
1.1.1.A	30 March 2009	JO Version Created

Appendix A: JO Critical Protection Bypass Register

Date Bypassed	Time Bypassed	Operator On Duty	Tag Number	Description	Reason for Bypass	Date Back in Service	Time Back in Service	Operator on Duty

For Shift Handover:

I have reviewed and confirmed that this Bypass Register is correct and current.

Outgoing shift responsible person - Name: _____ Signature: _____ Date: _____ Time: _____

Incoming shift responsible person - Name: _____ Signature: _____ Date: _____ Time: _____

Appendix B: JO Critical Protections Bypass Audit Sheet

TOTAL NUMBER OF BYPASSES/INHIBITS/OVERRIDES
AT TIME OF AUDIT

BYPASSES/ OVERRIDES
INHIBITS

		Comments (Mandatory where answer is No)
Is the Bypass/Inhibit/Override classified correctly?	Yes/No	
Is the Bypass/Inhibit/Override Hazard Analysis completed and documented correctly?	Yes/No	
Was the appropriate level of authorization given before allowing bypass to take place?	Yes/No	
Do the Bypass/Inhibit/Override Registers reflect the true equipment inhibit status and correctly reflect the status of the Hazard Analysis forms?	Yes/No	
Are identified additional control measures in place?	Yes/No	
Have actions to be taken in the event of a genuine trip/alarm on the device inhibited/overridden been identified?	Yes/No	
Are bypassed devices or systems properly flagged or tagged?	Yes/No	
Are inhibits/overrides that have been removed correctly signed off?	Yes/No	
Did outgoing shift and incoming shift review and sign off Bypass Register?	Yes/No	

Identify any inhibits/overrides that are continually in use or frequently installed and request engineering support for a solution.

Remedial actions required:

General comments:

Audited by (Print Name):

Signature:

Time:

Date:

NOTE: Attach photocopies of relevant documents as appropriate.