

# The Justification for Continued Operation (JCO)

## An EFCOG White Paper

### **Purpose**

The concept of a Justification for Continued Operations (JCO) migrated from the licensed commercial nuclear power industry into the DOE/NNSA complex in the early 1990s. However, this concept has not been well explained, endorsed, or required formally by a Federal regulation or by a DOE order, standard, or guide. As would be expected, variations have arisen regarding when and how this concept should be applied. The Safety Analysis Working Group (SAWG) of the Energy Facility Contractors' Group (EFCOG) has developed this paper as guidance for the DOE/NNSA contractors on use and application of a JCO.

### **Background**

In the early 1980s, a licensed nuclear power plant informed the U. S. Nuclear Regulatory Commission (NRC) that the utility no longer had the records to prove that certain equipment in the facility was actually qualified to endure a major seismic event as was required. In a sense, the plant was technically no longer within the limits of its license. The NRC could have required the immediate shutdown of the nuclear facility. However, the NRC recognized that the plant had just been licensed a few years previously and the proper seismic qualification records had been reviewed at that time. Rather than now require that the plant be shutdown, the NRC offered the utility the opportunity to develop a "justification for continued operations." Upon NRC approval of the JCO, the plant was permitted to continue operations. This event is thought to be the birth of the concept of the JCO.

The allowance of the use of the JCO signaled a more flexible, more safety oriented regulatory posture. This posture not only did not require an immediate shutdown, but instead allowed the utility a few days to develop the JCO and a few days for the NRC review thereof. During this period of days, the utility could have been considered as in some form of regulatory limbo, but with the tacit approval of the NRC. The risk to the safety of the public due to a possible seismic event that might have occurred during this brief period was negligibly small. The result of taking that small risk was that the plant was not required to shutdown due to purely administrative reasons that may have had little bearing on safety and which could have cost the utility a large amount of money.

In the late 1980s and early 1990s, some NRC management personnel came to the DOE/NNSA and brought with them some of the more successful NRC-experiences, including the concept of the JCO. However, since the concept was not explained formally, variations arose as to when and how to apply this concept within the DOE complex.

Federal regulations (10 CFR 830, *Nuclear Safety Management*, Subpart "B," Safety Basis Requirements) require that a safety basis be developed by the DOE/NNSA contractor that operates a Hazard Category 1, 2, or 3 nuclear facility, and that the safety basis be approved by DOE/NNSA. Moreover, these regulations require (specifically Section 830.201) that the contractor must operate a DOE nuclear facility only within the bounds of the safety basis.

If a contractor were to discover an unforeseen situation wherein the facility could not conform to some aspect of the approved safety basis, then the contractor would be faced with having to cease operations [10 CFR 830.6] and placing the facility in a safe configuration [10 CFR 830.203(g)(1)].

The DOE did, however, issue a major interpretation regarding the Unreviewed Safety Question (USQ) process (then covered by DOE Order 5480.21, *Unreviewed Safety Questions*, and later codified in 10 CFR 830.203, unreviewed safety question process). This interpretation is identified as DOE Memorandum "Interpretation of DOE 5480.21, 'Unreviewed Safety Questions,'" dated December 29, 1992, from William H. Young, Assistant

Secretary for Nuclear Energy, to the DOE principal secretarial officers and to the DOE field office managers. This interpretation addressed two matters: the need for DOE 5480.21 and guidance regarding the potentially inadequate safety analysis (PISA) portion of the USQ process. This interpretation contained information relevant to JCOs. Some of the more pertinent passages are presented below.

The purpose of a JCO process is to provide a means for a contractor to obtain DOE approval of operations of a facility on a temporary basis when the current requirements cannot be fully met. In effect, a JCO is a request for approval to operate temporarily beyond the current authorization basis.

The JCO process involves justification to operate outside the authorization basis temporarily, while the USQ [process] determines if “changes” are within the current authorization basis or if a revision to that basis is required.

In some situations, the contractor might use both the USQ process and the JCO process. For example, suppose a contractor discovers a discrepancy between the physical configuration of the facility and the facility accident analysis. The contractor might determine that this discrepancy involves a USQ and, therefore, DOE approval is necessary. In such a case, the corrective action could involve hardware modifications, which might take several months to design, procure, and install. In order to permit continued operations in the interim, the contractor might develop a JCO for temporary operations and submit it to DOE for approval.

The first two paragraphs speak about the JCO in a broad sense for unexpected temporary situations, while the third paragraph indicates more specifically that, in some situations, the JCO may be associated with the USQ/PISA process.

It should be noted that the passages from this interpretation refer to the “authorization basis.” Subsequently, DOE has codified in 10 CFR 830 Subpart “B” the concept of the “safety basis” as a subset of the authorization basis. As stated above, the contractor is required to operate within the safety basis.

The EFCOG has undertaken the development of a guidance paper on when and how to use the JCO process. A panel discussion was held in Albuquerque NM in mid-February 2006, where much input was received from the panelists as well as from the audience. An initial draft of this paper was developed by Safety Basis subgroup members who participated in that meeting. Later, this paper was reviewed by the SAWG and then by the EFCOG itself.

## **Discussion**

The JCO process offers an alternative to the possibility of having to cease operations (including handling hazardous materials) when an unplanned situation arises. **A JCO is a mechanism by which a DOE/NNSA contractor that operates a Hazard Category 1, 2, or 3 nuclear facility may request that DOE/NNSA review and approve a temporary amendment to the facility safety basis that would allow the facility to continue operating in view of a specific unexpected situation, the safety significance of the situation, and the compensatory measures being applied during this period.** The JCO is intended to be a document that can be developed in a few days, not weeks or months. When DOE/NNSA approves such a JCO, the approval is in effect a temporary expansion of the safety basis that would permit operations to continue under specified conditions, including a defined termination point. The DOE/NNSA-approved JCO becomes a temporary part of the facility safety basis. The JCO process would therefore include the development and submittal of a proposed JCO by the contractor, and the review and approval action taken by DOE/NNSA, including the formal incorporation of an approved JCO into the facility safety basis.

The JCO would be expected to define an appropriate set of temporary hazard controls (that is, compensatory measures) to be in effect during the life of the JCO. In some cases, these hazard controls might involve temporary changes to the facility Technical Safety Requirements (TSRs).

The JCO should have a pre-defined limited life, only as may be necessary to perform the safety analysis of the unexpected situation, to identify and implement corrective actions, and to update the safety basis documents on a permanent basis. The JCO should define the termination point of the life of the JCO. In most cases, this would take the form of a functional point, such as the completion of turnover of a physical modification for routine operations, which would occur after implementing the modification, post-modification testing, updating the “critical” documentation, and training of the operations staff. A calendar date for the termination point is not recommended, because schedules are subject to change due to unforeseen circumstances, and hence, a calendar date is likely to become problematic. However the termination point(s) may be defined in the JCO, they become binding when DOE approves the JCO. In some situations, DOE concurrence on having reached the termination point(s) and hence closure of the JCO might be appropriate.

If a JCO is prepared early and approved by DOE/NNSA, and later the analysis of the discovered situation shows significant new information, the JCO should be revised and resubmitted for approval.

The scope of each JCO should typically be narrowly defined, dealing with only one specific issue. If unrelated issues were to be involved, it would be a better practice to have a set of JCOs developed with one JCO addressing each issue separately. This would facilitate a one-to-one relationship between the issue being addressed and the compensatory measures. It would also allow a clearly defined termination point for each JCO.

One of the situations where multiple JCOs might seem to be appropriate is the situation of a facility in the midst of a design basis reconstitution program. In these cases, one expects to find records that may appear to disagree with the currently approved safety basis. In fact, such findings are quite likely – leading to multiple instances of such findings. Some contractors have taken the approach of preparing one JCO that generically addresses all such findings. When another such finding/discrepancy is discovered, it is frequently added to the list of discrepancies in the already existing JCO. While such a compilation of these similar findings is convenient, it loses the correlation between a specific discrepancy and its associated temporary hazard controls (compensatory measures). In addition, the compilation approach creates the problem of which compensatory measures might be appropriate to be removed when a specific issue/finding is resolved.

Therefore, EFCOG recommends that the scope of each JCO be limited to one specific issue. However, on a case-by-case basis, it might be appropriate to use a single JCO to address multiple interrelated issues to demonstrate the adequacy of the proposed safety posture considering the interrelationships of the issues. When this approach is taken, the JCO must map the compensatory measures applicable to each issue and clarify how compensatory measures would be discontinued as the individual issues are resolved and closed.

Any expansion of the safety basis afforded by the JCO should not be used as the baseline upon which to authorize new proposed activities or changes via the USQ process. Because the JCO is established in response to an unexpected condition, event, or new information, it is inappropriate to use it then in planning new activities without specific DOE approval. In addition, the temporary nature of the JCO could leave a contractor vulnerable to a subsequent PISA condition when the JCO is closed or removed.

It is anticipated that contractors who have not already done so will develop a procedure addressing when and how to use the JCO process. That procedure should preferably be a stand-alone procedure or alternately as a part of the USQ process procedure. The stand-alone procedure approach would be obviously preferred if there is any situation that could arise for the need of a JCO that does not also involve the USQ process. For the stand-alone procedure, it may be desirable to provide a brief summary of the JCO process in the facility documented safety analysis (DSA). This approach would permit DOE/NNSA review and approval as part of the process of reviewing and approving an update to the facility DSA. This approach would add a degree of sanction to the JCO process.

In some cases in the past, related to the PISA portion of the USQ process, some contractors have interpreted the regulation to imply that when DOE/NNSA had been notified of the discovery of a PISA situation, as required by

10 CFR 830.203(g)(2), that if DOE/NNSA did not object to the operational limitations initially placed on the facility to achieve and maintain a safe configuration (compensatory measures), then DOE/NNSA approval had been granted tacitly. Most, if not all contractors, consider the compensatory measures instituted as part of the PISA portion of the USQ process to be an implicit part of the facility safety basis, which cannot be removed by the contractor except as provided in the regulation and its associated Implementation Guide, DOE G 424.1-1. In addition, when the evaluation of the safety of the situation is submitted, as required by 10 CFR 830.203(g)(4), DOE approval of interim operations pending the completion of the corrective actions that may be proposed and contained in the evaluation of the safety of the situation may in some cases have been assumed by the contractor.

With regard to the tacit approval of the compensatory measures put in place, DOE/NNSA did not include any requirement in the regulation that DOE/NNSA should take approval action on the compensatory measures instituted by the contractor to place the facility in a safe configuration. Further, the notification required by 10 CFR 830.203(g)(2) of the discovery and the associated compensatory measures instituted affords DOE/NNSA the opportunity to require different or additional compensatory measures, in the event that the compensatory measures taken by the contractor do not seem to be appropriate or adequate. Hence, DOE/NNSA approval appears not to be necessary so long as those operational restrictions remain in effect. With regard to treating the compensatory measures as a part of the safety basis, there is no regulatory requirement for this treatment, but EFCOG considers this good practice.

However, the consideration of approval to continue operations while the evaluation of the safety of the situation is being developed and the approved corrective actions are being implemented is less obvious and may create a degree of enforcement vulnerability. This is because the contractor could be viewed as operating outside the approved safety basis without DOE/NNSA approval. This situation is compounded by the fact that there is no time limit specified for the submittal of the evaluation of the safety of the situation, and in some cases has involved months. Therefore, EFCOG strongly recommends that the approval of such interim operations be formalized using the JCO process.

The current version of the DOE Implementation Guide for the USQ process (that is, DOE G 424.1-1A issued on January 20, 2006 for interim use and review) addresses the situation where a contractor may become faced with several PISA situations due to multiple issues identified by an audit. Consideration should also be given to the need to request a JCO (or set of JCOs) to cover continued operations while the issues are being evaluated, resolved, and appropriate corrective actions are implemented.

A process has been developed for some DOE/NNSA nuclear facilities that involves an Operability Determination. There has been some confusion between an Operability Determination and a JCO. The essence of any Operability Determination is, when a structure, system, or component (SSC) becomes degraded to some degree, to ascertain if the SSC may still be able to perform its safety functions and meet the associated functional requirements and performance criteria. The Operability Determination uses the principles discussed in Section 4.10.3 of DOE G 423.1-1, the TSR Implementation Guide. If the SSC can still perform its safety function etc., the SSC remains operable. For example, it is not unusual for some nuclear instrumentation channels that are important to safety to provide a panel-mounted indicator as well as to drive a strip-chart recorder. If the recorder were not functioning, the safety function of the instrumentation channel might still be met. The Operability Determination determines if a degraded SSC is still operable in the sense of meeting its safety needs, albeit not still able to meet some other types of needs. If the SSC remains operable, the facility TSRs would continue to be satisfied, and facility operations may continue. The JCO is used, in contrast, for the situation where an SSC is not operable, but there is a safety rationale for not having to cease operations of the facility.

A JCO, as discussed in this paper, would not be an appropriate format to request an expansion of the safety basis for a planned new operation or activity. Using a JCO for planned activities is not consistent with the usage of JCOs for unplanned situations. For planned operations or activities that may be beyond the currently approved facility safety basis, a requesting document with some other name (such as a routine Request for an Amendment to the Facility Safety Basis or a supplement to the safety basis) should be prepared by the contractor and submitted to DOE/NNSA for review and approval. This Request for an Amendment to the safety basis or

supplement to the safety basis might be used to cover operations such as short campaigns, special tests, extended outages, etc. Those DOE contractors that have previously used the title “JCO” for documents to request temporary addenda to facility safety bases for planned short-term operations and activities may find it advantageous to revise the approach for the future requests for planned short-term operations by using a different title for the document, without any attempt to revise previously approved documents.

One contractor has instituted the use of an “Interim Safety Basis” (ISB) to be applied to: process changes, design and configuration changes, transitory states (such as during construction or modification to implement a process change or a design change), and other changes such as an as-found condition that is discrepant with the safety basis for which continued facility operation is desired. An example of the application of the ISB is the installation of a new caustic waste tank in a radiological waste facility. One condition is that the use of the ISB must be negotiated with the local DOE/NNSA office beforehand. Because of its intended flexibility and the need for beforehand negotiation, the content of the ISB becomes important. The ISB must contain information addressing the first five chapters specified in DOE-STD-3009, which includes an Introduction, a description of the facility and its operations, the hazard and accident analysis, a description of important SSCs, derivation of TSRs, plus any attachments that may be necessary for the approval of the ISB by DOE/NNSA. A key purpose of the ISB is to describe the unmitigated risks and the mitigated risks associated with the issue at hand, and to explain why those risks are acceptable and that adequate protection of the public and workers is provided.

Clearly, one of the planned applications for the ISB is traditionally the function of a JCO. If the content of the ISB addresses the attributes of a JCO, then the primary differences become (a) the name of the document and (b) the degree of rigor of the analysis presented. Based on the description of the ISB above, the degree of rigor of an ISB is greater than for a document that can be developed in a few days. In that the DOE/NNSA is involved with the development beforehand and approves its contents afterwards, then the approach should be acceptable, at least on a local level.

## **Conclusions**

A Justification for Continued Operations (JCO) should be defined to mean a mechanism by which a DOE/NNSA contractor that operates a Hazard Category 1, 2, or 3 nuclear facility may request that DOE/NNSA review and approve a temporary amendment to the facility safety basis that would allow the facility to continue operating in view of a specific and unexpected situation, the safety significance of the situation, and the compensatory measures being applied during this period. When DOE/NNSA approves such a JCO, the approval is in effect a temporary expansion of the safety basis that would permit operations to continue under specified conditions, including a defined termination point. An approved JCO is a part of the facility safety basis. The EFCOG has therefore reached the following conclusions:

- ◆ The scope of each JCO should generally be narrowly defined, dealing with only one specific issue. However, on a case-by-case basis, multiple interrelated issues might be addressed in a single JCO provided that the JCO maps the compensatory measures against each issue and describes how compensatory measures might be removed as the individual issues are resolved and closed.
- ◆ The JCO should define a set of temporary hazard controls (that is compensatory measures) appropriate to the issue to be in effect during the life of the JCO.
- ◆ The JCO should have a pre-defined limited life, only as may be necessary to perform the safety analysis of the unexpected situation, to identify and implement the corrective actions, and to update the safety basis documents on a permanent basis.
- ◆ Some document format other than a JCO should be used to request approval for a planned operation or condition that would be beyond the currently approved facility safety basis.

- ◆ It would not be appropriate to use the temporary expansion of the safety basis afforded by the JCO as the baseline for justifying new planned activities or changes via the USQ process.
- ◆ In some cases, it may be desirable to describe the JCO process in the facility documented safety analysis (DSA). This approach would permit DOE/NNSA review and approval of this process as part of reviewing and approving an update to the facility DSA.

### **Suggested JCO Content**

The following topics should be addressed in a Justification for Continued Operation (JCO).

1. Executive Summary (Optional, depending on length of document)
2. Purpose of the Document (JCO)
3. Discussion of Background (What condition(s) led to need for JCO)
4. Impact on Hazards/Risks (Increases in hazards/risks due to the condition)
5. Compensatory Measures (Risk-reduction activities being applied immediately)
6. Net Risk Considerations (Risk basis for JCO)
7. Planned Corrective Actions (Actions that will be developed as the permanent solution)
8. Termination of JCO (Those events/date that will define termination of JCO)