
EFCOG Safety Analysis Work Group (SAWG) Recommendations

White Paper to Improve the Unreviewed Safety Question (USQ) Process

The following recommendations are a consensus of the EFCOG Safety Analysis Working Group (SAWG) – Unreviewed Safety Question (USQ) Subgroup members, made up of DOE Contractors, as an appropriate means of implementing 10 CFR 830.

Executive Summary:

The following proposal is a set of recommended actions to improve efficiency of the Unreviewed Safety Question (USQ) process, allowing for better stewardship of taxpayer resources and limited DOE funding. Benefits include: minimizing direct and indirect costs for implementation; focusing on key safety issues; focusing manpower on high priority and value added work, minimizing unnecessary schedule delays. Clarification of the following topics would increase efficiency of the USQ process until a subsequent revision of the DOE USQ Guide. Found by years of experience, many USQ reviews do not add value and are not necessary for implementing 10 CFR 830.203. Numerous audits have shown that positive USQDs have not been missed, instead criticism has revolved around proper processing and documentation. The inefficiency of the current USQ process is thus a result of the type and vast quantity of changes that enter of process (see Table 1), and subsequently the documentation level of detail required in conducting the USQ reviews. In essence, there are many steps that a change must pass through and the amount of work required for each step is excessive.

The risk, that a change requiring DOE approval is not submitted to DOE for approval, is insufficient to warrant the additional unnecessary expense. There is a low risk of missing USQs, and a high confidence that contractors are applying the process correctly in accordance with 10 CFR 830. Safety management programs are managed under their own regulatory structure (e.g., 10 CFR 835 and 10 CFR 851), verified by ISMS processes, and reverified by periodic ISMS reverifications. Years of operating experience show this approach works. The USQ process can be improved, becoming more efficient and effective. Based on a survey of DOE sites (which include NNSA, DOE-EM, and the Office of Science), shown in the Appendix, the most promising opportunities for improvement are the following. They could to improve the efficiency of the USQ process by up to 50%.

- Clarification of Applicability Assessments for Temporary or Permanent Changes in a Facility and Procedures
- Screening, including Clarification of Sufficient Level of Documentation in Screening
- Expert Unreviewed Safety Question Determinations

The following additional opportunities for improvement can significantly improve the efficiency of the USQ process. Some sites have already implemented these improvements.

- Clarification of Terminology/Definition
- Clarification of Sufficient Level of Documentation in Applicability Assessments
- Clarification of Sufficient Level of Detail in Standard USQD

Furthermore, we recommend a DOE Complex wide meeting reflecting the above USQ process improvements to ensure a consistent approach across the DOE Offices, Field Offices, Service Centers, and Assessment Organizations. There is too much variability in interpretation of details in the USQ process which is driving to excessive workload.

Issue:

The USQ process as described in DOE G 424.1-1A and implemented at most of the DOE sites is overly burdensome. The interpretations of the Guide, as interpreted differently by the local DOE Site Offices and as enforced from audits at most sites, has resulted in a process that reviews excess work documents and requires significant amount of documentation. For example, at a large DOE site, approximately 15,000 proposed activities enter the USQ process each year. The amount of time to review and document the review each of these proposed activities varies from 4 to 40 work hours. Assuming an average of 10 work hours per proposed activity, approximately 150,000 man hours are spent on the USQ process each year for a large DOE site. Of the 15,000 proposed activities well under 100 of them will result in a change that requires DOE approval. Note: At many sites, the proposed activities that clearly require DOE approval bypass the USQ process and go directly to DOE as a safety basis change for approval, obviating the need for completing a USQ review (however, these are included in the above numbers for completeness). Furthermore, the USQ process has grown beyond its original intent as required by 10 CFR 830.

The USQ Subgroup believes that the proposed recommendations will effectively streamline the process while maintaining the necessary rigor to ensure the proposed activities that required DOE approval, obtain that approval. The recommendations do this by:

- reducing the number of changes that enter the USQ process,
- appropriately relying upon the existing regulatory infrastructure for safety management programs,
- reducing the level of documentation and time required for performing each level of USQ review (e.g., Screen, USQD), and
- reducing the number of USQDs required.

Explanation of Problems with the Existing DOE USQ Process

- The USQ process is overly burdensome without commensurate value to implementing 10 CFR 830.203.
 - Too much enters the USQ process (e.g., trivial changes that could never warrant DOE approval):
 - Routine maintenance packages enter USQ process
 - Safety Management Programs (SMPs) enter USQ process
 - Significant duplicate effort of technical reviews of safety management programs
 - The original discussion of safety management programs in the Introduction to DOE-STD-3009-94 (pg. 9) implies it was not the intent of that Standard to require the infrastructure of safety management programs to routinely be submitted to the USQ process. That concept should be revisited as there are extensive costs with such routine submittals that are largely redundant given that entire staffs of safety management experts oversee those programs.

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- Too many changes are elevated within the USQ process to USQDs and require excessive level of detail and documentation.
 - USQDs are required to be at a level of detail far beyond what merited by risk that a change requiring DOE approval is not submitted to DOE for approval
 - Time period, manpower, dollar information contained in attached table.
 - There is a low risk of missing USQs, and a high confidence that contractors are applying the process correctly in accordance with 10 CFR 830. The risk, that a change requiring DOE approval is not submitted to DOE for approval, is insufficient to warrant the \$20 to \$40 million per year expense. The USQ process is just to determine approval authority, not to determine if the change is safe.
 - There is a burden in excessive documentation.
 - Lack of clarity in the DOE USQ Guide flows into problems with local implementing procedures and auditors. Further, it makes the USQ process subjective. The DOE Complex has been whipsawed by changes in auditing interpretations by different auditors on multiple occasions.
 - Confusion on applicability of USQ process, changes which can be Screened, and changes requiring a USQD result from inconsistent terminology in the DOE USQ Guide:
 - ‘USQD’ and ‘screening’ are inconsistently used throughout the Guide.
 - Confusion of “USQ process” and “a change requiring a USQD.”
 - These are two different concepts; however, the wording is used inconsistently.
 - ‘USQD’ is generally understood to mean application of the seven questions.
 - However, in multiple locations, ‘USQD process’ refers to the implementation of the DOE-approved USQ procedure (i.e., ‘USQ process’) that may/may not require a USQD.
 - These details are very important in implementation and have considerable resource, manpower, cost, and schedule implications that are not commensurate with value to implementing 10 CFR 830.203.
 - Confusion of Applicability Assessment and Screening
 - Applicability Assessment: whether change is inside or outside of USQ process.
 - Screening: review inside USQ process which indicates if a USQD is required.

Implications of Existing Problems

- Overly burdensome without commensurate value to implementing 10 CFR 830.203.
- DOE USQ process consumes too much of DOE’s limited resources (cost savings of potentially \$20 to \$40 million per year).
- Concern that this is not a wise stewardship of taxpayer dollars
 - Large costs to implement, direct and indirect
 - Manpower diverted from higher priority/value added topics
 - Focus diverted from key issues
 - Schedule delays
 - Morale issues

How the Proposal will Help

- Limit the USQ Process to its main purpose - “Determination of Approval Authority.” USQ Process is not change control or determining if the change is safe. Do not duplicate the role of safety management programs. Do not require excessive documentation nor level of detail; focus DOE's limited resources on key issues.
- Build upon improvements in DOE G 424.1-1B, consolidating and improving consistency for the rest of the DOE USQ Guide.
- DOE USQ Guide, since it was drafted, has been subjected to many small changes, additions, clarifications, etc. that have had the effect of rendering it difficult to use and inconsistent.
- Focus on Regulatory Basis, e.g.,
 - USQ Determination – Definition of USQ in 10 CFR 830.3
 - Screening – Criteria in 10 CFR 830.203(d)
 - Documentation of USQ process implementation – 10 CFR 830.6
- Opportunities for Improvement
 - What enters the USQ process and what does not
 - Clarifying treatment of safety management programs
 - Clarifying treatment of routine maintenance
 - What is elevated to a USQD
 - What level of documentation is sufficient
 - Improving internal consistency of DOE USQ Guide to ensure consistent interpretation.

Bases for Recommendations:

The purpose of the USQ process is to determine who has approval authority – DOE or the contractor. This white paper discusses information from 10 CFR 830, DOE-STD-3009, DOE G 424.1-1A, as well as other bases. They are provided in the relevant sections. An overarching bases for the recommendations is 10 CFR 830 Appendix A,

“The USQ process is an important tool to evaluate whether changes affect the safety basis. A contractor must use the USQ process to ensure that the safety basis for a DOE nuclear facility is not undermined by changes in the facility, the work performed, the associated hazards, or other factors that support the adequacy of the safety basis.

The USQ process permits a contractor to make physical and procedural changes to a nuclear facility and to conduct tests and experiments without prior approval, provided these changes do not cause a USQ. The USQ process provides a contractor with the flexibility needed to conduct day-to-day operations by requiring only those changes and tests with a potential to impact the safety basis (and therefore the safety of the nuclear facility) be approved by DOE. This allows DOE to focus its review on those changes significant to safety.”

Proposal/Recommended Actions

Clarification of Terminology/Definitions

Margin of safety: A margin of safety is a delta between two values for the same parameter explicitly identified in the TSRs, i.e., Safety Limit (SL) basis section. For example, the design pressure for a pressure vessel cited in the TSR (the Safety Limit) may be 500 psi and the Limiting Condition for Operation may be 400 psi, therefore the margin of safety is 100 psi. Another example, the design pressure for a pressure vessel cited in the TSR (the Safety Limit) may be 500 psi and the value at which the pressure vessel would burst is 600 psi, therefore the margin of safety is 100 psi. The margin of safety is explicitly identified in the DSA/TSR, it is not implicit. A control not carried forward to the TSR is not a margin of safety.

Equipment important to safety (EITS): Structures, systems, and components (SSCs) whose function can affect safety either directly or indirectly, in a substantial way. This includes safety class and safety significant SSCs, including support systems to these systems that are necessary for the safety function, and other systems that perform an important defense-in-depth function, equipment relied on for safe shutdown, and in some cases, process equipment. EITS, as a class, goes beyond Safety SSCs but is not expected to include the majority of SSCs in a facility. This white paper clarifies that one example, a best practice from lessons learned, is to document EITS on the DOE approved list of EITS for a given safety basis (which may be contained in the DSA or maintained separately subject to DOE approval). Note that this is not a requirement.

Clarification of Applicability Assessment (including clarification of routine maintenance, AEP, work control process, control of hazards during installation, safety management program disconnect with DOE-STD-3009).

Entry to the USQ process is determined by an applicability assessment consistent with the DOE-approved facility/site USQ procedure. This assessment is part of the facility's change control process; it does not need to be documented for the USQ process and is not subject to the document retention requirements of 10 CFR 830.¹ Examples of changes that are excluded from the USQ process are changes to purely administrative procedures, changes to non-nuclear facilities that cannot effect nuclear facilities, changes that already require DOE approval such as Training Implementation Matrix (TIMs) and Technical Safety Reports (TSRs), and routine maintenance as described below. Such exceptions may be described in the DOE-approved USQ procedure, but implementation occurs in other programs and procedures. It is important, however, that the applicability assessment not be used to circumvent proper entry into the USQ process.

The following subsections discuss applicability of the USQ process for the 3 entry conditions to the USQ process in accordance with 10 CFR 830.203(d): Temporary or Permanent Changes in a

¹ Documents produced within the USQ Process which must be prepared by qualified USQ personnel are subject to document retention requirements of 10 CFR 830. This includes Categorical Exclusions, USQS, Expert USQDs, and USQDs; but does NOT include Applicability Assessments.

Facility, Temporary or Permanent Changes in the Procedures, and Tests or Experiments Not Described in Existing DSAs.

- **Temporary or Permanent Changes in a Facility**

In accordance with 10 CFR 830.203(d) (1), a temporary or permanent change in the facility as described in the safety basis enters the USQ process. Note that although safety analyses include descriptions of many SSCs, a nuclear facility also contains many SSCs not explicitly described in the safety analyses. These can be components, subcomponents of larger components, or even entire systems. Changes to SSCs that are not explicitly discussed in the safety analyses should not be excluded from the USQ process because changes to these SSCs may have potential to alter the function of an SSC explicitly described in the safety analysis. Also, a change to an SSC that does not involve equipment important to safety could initiate an accident or affect the course of an accident.

Routine maintenance is not a change to the facility. Routine maintenance activities do not require review under 10 CFR 830.203. Routine maintenance activities include calibration, refurbishment, part replacement, and housekeeping. An SSC is not considered changed by routine maintenance activities that restore the SSC to its original condition (e.g., refurbishment, exact replacement, or approved equivalent part).² Note, however, that interim conditions require further thought (see discussion below).

It is important to distinguish between changes and routine maintenance activities. Modifications that cumulatively and significantly alter the capability of a system, e.g., plugging heat exchangers and thereby changing the attainable heat flux, is a modification and should be entered into the USQ process.

A TSR limitation on maintenance activities might require limiting the number of systems or components that can be taken out of service at one time, or allowable outage times. A TSR should specify allowable outage times, permissible mode conditions, and permitted reduction in redundancy for systems or components removed from service for maintenance. The USQ process need not be entered for these activities.

“Change” as it applies to modes of operation or facility processes is important when, for example, a facility designed to accommodate several nuclear processes will modify equipment lineups to accommodate shifting from one process to another. Changes performed in accordance with approved procedures and considered within the safety basis of the facility are not considered changes in the facility procedures for the purposes of 10 CFR 830.203(d) (2).

² An Approved Equivalent Part (AEP) involves replacing one component with another which a facility engineer has evaluated and determined that the replacement item meets all the requirements pertinent to the specific application, including the service conditions.

DOE relies on the contractor's normal work control procedures to address worker hazards involved in the actual installation of a modification, not on the USQ process. These procedures implement safety management program requirements including radiation protection, hazardous material protection, work planning and control, Occupational Safety and Health Administration, ALARA (as low as reasonably achievable), and lockout/tagout. Examine the safety basis (e.g., hazard analysis) for what has been evaluated for interim conditions. Interim conditions dictated by standard safety management programs, such as general rigging and scaffolding considered in the safety basis (e.g., hazard analysis)³, do not enter the USQ process.

Interim conditions that change how the facility operates, in a manner not described by procedures already subject to the USQ process, do enter the USQ process. Such changes could include: rerouting ventilation to utilize temporary ducting, temporary changes such as jumpers and lifted leads, temporary blocks and bypasses, and equipment used on a temporary basis in lieu of installed equipment. Work involving unique initiators performed outside standard safety management programs is subject to the USQ process.

For example, if work involves interrupting a water supply that a fire protection system depends on, in a manner not covered by a TSR, that interruption should be examined through the USQ process. Modifications that are performed in separate, distinct stages (usually for cost, schedule, or operational considerations) may also leave affected SSCs in conditions not addressed by a USQD that evaluates only the final modification configuration but not the interim times between stages. The work authorization system should include a step to consider these types of possibilities.

- **Temporary or Permanent Changes in the Procedures**

In accordance with 10 CFR 830.203(d) (2), a temporary or permanent change in the procedures as described in the safety basis enters the USQ process. Changes to procedures include revisions to existing procedures, developing new procedures, and cancelling existing procedures. Purely administrative documents (e.g., 401k, finance, procurement, travel procedures) are not procedures subject to the USQ process. Procedures may be identified explicitly or implicitly in a facility DSA. If the procedure is implied directly by the nature of a topic in the safety basis (including the operational safety requirements or TSRs and their bases), that change should be considered to be to a procedure described in the DSA, so that a USQD is done when appropriate. Such implicitly described procedures include—

³ For example, a critical lift over EITS is not considered general rigging. A lift which is performed by specific work instructions which has been submitted to the USQ process is not itself subject to the USQ process. However, a critical lift which is not performed to work instruction subject to the USQ process is subject to the USQ process.

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- the procedures that implement a safety management program (SMP) described in the safety basis,
 - procedures for implementing a specific administrative control (SAC), and
 - operating, testing, surveillance, and maintenance procedures for equipment important to safety .

Procedures are not limited to those specifically identified by type (for example, operating, chemistry, system, test, surveillance, and emergency planning) but also include written direction as described in the DSA that defines or describes activities or controls over the conduct of work. Therefore, the following documents need to be reviewed under the USQ program:

- Documents that direct work in the nuclear facility (other than routine maintenance as described above in this white paper).
- Documents that capture the configuration in the nuclear facility and nuclear support facilities credited in the safety basis (i.e., facilities that provide a function to the nuclear facility [e.g., the control room, or the fire protection pump house]).
- Documents used to capture the initial conditions and assumptions used in the hazard analysis in the safety basis.
- Documents used to capture the qualification, evaluation (including failure modes) of equipment in the nuclear facility (e.g., hazard analysis and accident analysis).
- Documents that implement the TSR administrative controls.

Documents that do not meet the above should not enter the USQ process. Note: new procedures for new operations undergoing an IVR, RA, or ORR that have a nuclear safety review do not enter the USQ process.

Note that consideration of SMP procedures is complex. Safety management programs are governed by DOE and other national requirements, as well as contractual requirements, and are a fundamental and inherent premise of safety bases. Furthermore, there are 3 relevant Code of Federal Regulations (CFRs): 10 CFR 830, 10 CFR 835, and 10 CFR 851. Therefore, any changes to SMP procedures would need to be consistent with the safety management program governing document. DOE approval is not required for changes that are consistent with the contractual or legal requirements. The 3 CFRs and other requirements are connected and the following areas may need to be considered for whether DOE approval is necessary (i.e., USQ process is applicable). Note also that consideration may be given to whether the USQ process is appropriate for SMP procedures which implement safety management programs required as part of

the DOE Integrated Safety Management (ISMS).⁴ Given this complexity, one possible approach is to consider adding an applicability assessment/sanity check by safety analysts for SMP procedures as to whether they need to enter the USQ process. Considerations for whether the USQ process is applicable for SMP procedures include:

- What documents preserve the initial conditions and assumptions of the safety basis (e.g., DSA/TSR) and thus what does the USQ process need to review regarding SMP procedures?
- Is the change specifically defined in the DSA/TSRs beyond typical DOE safety management program requirements, e.g., minimum shift levels, numerical setpoints, SACs?
- Does the change protect the initial conditions and assumptions in the safety basis (e.g., hazard analysis), e.g., motor vehicle speeds, CAM setpoints?
- Is the change a deviation from programmatic commitments in the safety basis (process, not procedure changes)?

Based upon the above discussion, consider the following further considerations. Consider the DSA/TSR implementation flowdown. Top level procedures that implement the safety basis safety management programs enter the USQ process. Upper tier policies and plans that do not implement safety basis safety management programs do not enter the USQ process. Other, lower tier technical discipline procedures describe skill-of-the-craft for which a safety discipline (e.g., health physics) staff is specifically maintained to provide subject matter expertise (SME) guidance and evaluation (e.g., the exact way in which postings are to be configured in any facility, portable survey meter positioning and movement, and other subjects). The DSA is not intended to address such details per DOE-STD-3009. These are SME-level technical documents, maintained by ES&H organizations that provide guidance on proper performance of the detailed requirements associated with safety management programs. These documents are focused on compliance with governing statutes, regulations and DOE orders as opposed to primarily the safety basis. Contractors have historically considered such documents as falling under oversight, review and approval of the actual institutional safety management program function. Accordingly, such procedures should not be identified as falling within the USQ process.

See clarification on level of documentation.

⁴ In 10 CFR 830 Appendix A the relationship between the safety basis and Integrated Safety Management Program is recognized. "The safety basis requirements are consistent with integrated safety management. DOE expects that, if a contractor complies with the Department of Energy Acquisition Regulation (DEAR) clause on integration of environment, safety, and health into work planning and execution (48 CFR 970.5223-1, Integration of Environment, Safety and Health into Work Planning and Execution) and the DEAR clause on laws, regulations, and DOE directives (48 CFR 970.5204-2, Laws, Regulations and DOE Directives), the contractor will have established the foundation to meet the safety basis requirements."

- **Tests or Experiments Not Described in Existing DSAs**

In accordance with 10 CFR 830.203(d) (3), a test or experiment not described in the safety basis enters the USQ process. Tests and experiments not described in the safety basis should be interpreted to include new activities or operations. During normal operations or anticipated transients, such activities could degrade the ability of SSCs to prevent accidents or mitigate accident conditions. Therefore, the USQ process is applicable to new (or modified) tests, experiments, activities, and operations. The USQ process is not applicable every time routine preoperational, surveillance, functional, and startup tests and experiments are performed, provided that they are not changed. However, one-of-a-kind tests that measure the effectiveness of new techniques or a new system configuration that might affect safety SSCs should be submitted to the USQ process. Post modification testing should be considered and included in the USQD for the modification.

Integrated USQ Process

The USQ process should be integrated into the facility's change control processes. The change control processes should ensure that the USQ process is integrated into existing procedures, or that new procedures are developed as necessary, and that the need for entry into the USQ process is not overlooked. The overall purpose of the USQ process is to determine who has approval authority – DOE or the contractor. It is not to duplicate other aspects of the change control process or safety management programs covered by other DOE requirements (e.g., 10 CFR 835, 10 CFR 851). The USQ process should be clearly focused on who has approval authority – DOE or the contractor; not quality assurance, configuration management, design control, nor whether the change is safe.

Figure 1 shows the relationship of the USQ process and change control. The highlighted portion of the figure summarizes the USQ process. Note that as part of a facility's change control process, applicability assessments determine if the USQ process is applicable; they are not USQ documents.

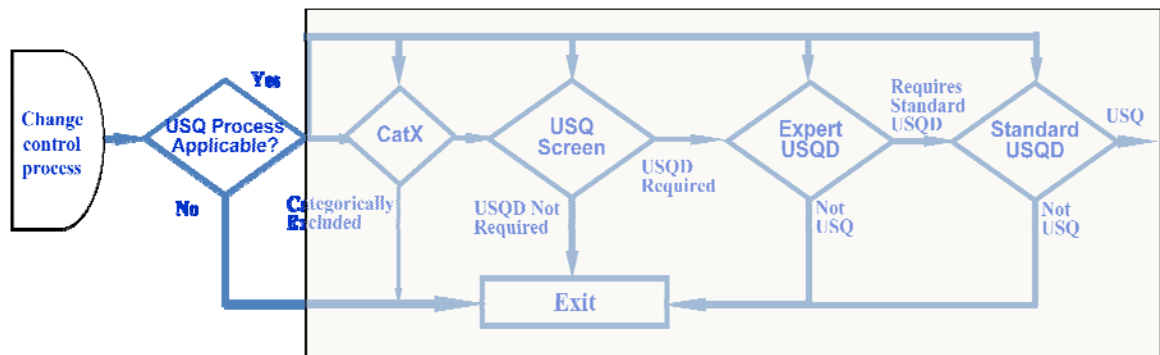


Figure 1. USQ Process (highlighted) in relation to Change Control Process

DOE recognizes that some changes do not warrant the investment of valuable time and resources required to perform a full USQD. In order to perform work safely and efficiently, and focus attention appropriately on changes requiring USQDs, the USQ process has four levels of review:

1. The first level consists of any Categorical Exclusions (Section 3.2).
2. The second level consists of a USQ Screening (Section 3.3) of proposed changes that were not categorically excluded in step 1 to determine if a USQD is required.
3. The third level consists of the Expert USQD (Section 3.4). This level applies to proposed changes that were not categorically excluded or screened out in the first two levels of the USQ process.
4. The fourth level consists of the Standard USQD (Section 3.5). This level applies to PISAs and proposed changes that were not categorically excluded, screened out, or determined not to be a USQ in the first three levels of the USQ process. PISAs require a Standard USQD.

Note that these levels of review are not required to be sequential.

Screening

USQ screening is used to ascertain if it is necessary to expend the valuable time and resources necessary to perform a USQD, or whether there is reasonable technical justification for not performing a USQD. The basis for screening involves determinations that changes to items identified in the DSA may not warrant the effort associated with a USQD. Specifically, is the issue:

1. A temporary or permanent change in the facility as described in the existing safety basis?
2. A temporary or permanent change in the procedures as described in the existing safety basis?
3. A test or experiment not described in the existing safety basis?

If all three questions based on the conditions can be answered “No,” a USQD is not required.

The question for a screening decision, which is within the USQ process, is not whether the affected item (SSC, procedure, or activity) is described in the safety basis, but whether the change fundamentally alters the description in the DSA. If the SSC, procedure, or activity continues to be appropriately and adequately described in the DSA as written, a USQ screening is allowed. Screening is intended to be a simple go/no-go decision-making step. It should require only a comparative reading of the change against the DSA description and should not take on the character of asking and/or answering the seven USQD questions.

An SSC would typically be considered changed *as described in the DSA* (and thus not eligible for screening) if any of the following were altered: (1) the function(s), (2) the method of performing those functions, (3) the design configuration beyond installation of an exact replacement or approved equivalent part, (4) a change in the conditions under which the SSC may perform its function, or (5) introduction of other components or factors that may compromise or challenge operation of an EITS (e.g., installing a water pipe over electrical switchgear).

A new or revised procedure that is verified to be consistent with the DSA (i.e., characteristics of a safety management program, SAC, operation, test, surveillance, or routine maintenance activity described in the safety basis remain correct, complete, and valid) can be screened. It is anticipated that the majority of procedure changes can be screened.

When appropriately streamlined, a screening decision can often be completed in a matter of minutes. The rationale for screening should be briefly stated in terms of the guidance in the preceding paragraphs. If full-page explanations are deemed necessary, the change should not have been screened. Further, screening should be performed only by personnel qualified to perform USQDs. Note again that screening is based on a comparison of the change with a simple reading of the DSA, not answering the seven USQD questions. If the preparer or reviewer finds themselves asking the seven USQD questions to justify a screen, then the change cannot be screened. If an item has not been screened out, or if doubt exists as to the appropriateness of screening, an Expert USQD or Standard USQD should be completed.

Screening consideration also is given to the possibility that the matter being considered is fully covered by a previous USQD (even when location differences are considered). Such screenings should document the USQD being referenced and explain how the change being considered is adequately addressed by that USQD.

Expert Unreviewed Safety Question Determinations

A short form, expert-based USQD, tailored to evaluate simpler proposed changes, may significantly increase the efficiency of the USQ Process. The purpose of an Expert USQD is to quickly determine, with minimal documentation, whether the change is not a USQ, or requires further evaluation in a Standard USQD.

The Expert USQD Worksheet may be applied to certain proposed changes where it is readily apparent to safety basis professionals that the change cannot create a USQ. The Expert USQD incorporates a review checklist, modeled after the USQD questions. However, checklist questions may be adjusted at the discretion of the local DOE Site Office. The outcomes of the Expert USQD are either the proposed change does not represent a USQ, or the change requires additional review via a Standard USQD. For those proposed changes found not to represent a USQ, the preparer may document any considerations deemed relevant as to why it is readily apparent a USQ would not exist. Such documentation should be brief and focused, and not be commensurate with the level of detail for a Standard USQD. Expert USQDs still require the same review and approval as a Standard USQD, although they must also be designated as “experts”.

If the reviewer had doubt about a definitive answer, then the Expert USQD should be abandoned and the evaluation documented in a Standard USQD. The contractor’s USQ procedure should also specify stricter qualification requirements for “experts.” Specifically, the intent is not to plug any preparer available into a rotating “expert” slot. Experts should have more lengthy career experience than the average USQD preparer, thorough knowledge of the facility and its operations as demonstrated by documented, sustained experience at the facility, and a history of preparing USQDs for that facility. The contractor’s USQ procedure should include a mechanism for a formally defined list of experts approved by the contractor’s institutional safety basis organization. Stringent qualification requirements for “experts” are key to implementation. Only the most experienced and trained personnel in the facility, its processes, and Safety Basis should qualify to sign as expert preparer.

Figure 1 is an example of how an Expert USQD could be included in the USQ Process.

Clarification of Sufficient Level of Documentation in Applicability Assessments

Applicability Assessments may be conducted as part of change control process, work control procedure, work package process, work authorization process, or procedure for procedures. The applicability assessment may or may not be documented, depending on the particular subtleties of the requirements in the integrated USQ process (i.e., the USQ procedure approved by DOE). The applicability assessments is performed by personnel in accordance with the DOE-approved USQ procedure.

There may be situations where the applicability assessment is documented, e.g., for consideration of whether a change has no impact on nuclear facility safety basis (yes/no). This may be done for consideration of whether particular procedures are subject to the USQ process as discussed above in the discussion on procedures. Under such an approach, an applicability assessment signature by USQ qualified personnel on a change package suffices as sufficient documentation that the change does not impact the nuclear facility safety basis and thus does not need to enter the USQ process. The focus is on the review of the change, not on the documentation of the change. Appropriate emphasis may be placed on enforcement rather than documentation.

Clarification of Sufficient Level of Documentation in Screening

The USQ Screening of a proposed activity can be documented with only an approval signature from a qualified individual on the proposed work document. A Screening signature on a procedure suffices as sufficient documentation that the change does not require a USQD. Focus is on the review of the change, not on the documentation of the review. This is conducted by qualified USQ personnel. Appropriate emphasis may be placed on enforcement rather than documentation. 10 CFR 830 does not prescribe any formal or required screening element, but rather dictates only a USQ Determination when a change is identified. Given the “go-no-go” intent from the existing DOE USQ Guide, the decisions for identifying a change should be relegated to a signature as discussed above.

Clarification of Sufficient Level of Detail in Standard USQDs

The contractor’s USQ procedures should include documenting defensible technical explanations based on sound engineering judgment for each of the answers to the seven questions. The USQ procedure should identify the level of detail necessary to document performance of a Standard USQD and conclusions reached; specification of references relied on to reach the conclusions; and guidance for the retention of records. This documentation should be complete in the sense that a qualified independent reviewer, trained in the USQ process, could agree with the overall USQD conclusion on the appropriate approval authority – DOE or the contractor. A Standard USQD contains the appropriate level of detail if it provides sufficient information to understand the change and its relation to the DSA, i.e.,

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- Fundamental details of the change necessary to have a cohesive mental picture of the change; and
 - Basis for judgments relative to the safety basis.

The USQD does not need to restate the text contained in the DSA. It is acceptable for reviewers to ask for clarifications of USQD content or DSA details. The target audience is a degreed engineer or scientist with several years of experience in the DOE Nuclear Complex, but not necessarily at the facility in question.

Appendix with Supporting Data

Table 1. Current USQ Process*

CY 2009**	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10	Site 11	Site 12	Site 13	Site 14	Site 15	Site 16	Site 17
Changes that entered USQ process	15,000	2,958	2,000	365		780	2,500	1,000		3,000	2,476	238	3,060	25,000	3,550		8,371
CatX's		137			12		300	550		150		0	60	11,400	418		6,343
USQ Screens		823		325	4,000	350	800	130	137	825		238	3,000	11,400	1,069	1,300	1,585
USQDs		1,998		48	100	430	1,300	300	514	2,000	1,300	214	30	2,200	2,063	700	443
USQs (Positive USQDs) and Safety Basis amendments	100	11	14	0	7	3	8	20	4	11	6	1	25	4			16
Avg. time per USQD (hrs)***		6	11	8	34	9	15	15		6		3	40	5	20		8
Avg. time per screening (hrs)		2		3	6	3	1	4		2		8	5	1	3		3

*Note: These statistics reflect that some sites have already implemented the improvements discussed in this white paper.

** Note: These statistics reflect data from last year or the average across the last several years. The number of facilities varies from site to site.

***Note: Differences in site missions and configuration management/work control processes drive these variations. The complexity of their activities can make a significant difference in the amount of time required to prepare a USQD. For some waste sites, USQDs do not generally require more than a few hour to prepare. For other sites, the amount of work preparing input for the USQD varies and reduces the time for actual preparation of the USQD.

Table 2. Raw Data on Estimated Effects of Process Improvements (in %)*

	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10	Site 11	Site 12	Site 13	Site 14	Site 15	Site 16	Site 17
Clarification of Terminology/Definitions**				20	20	0	2	0	5	2	1				5		0
AA – Facility Change: Routine maintenance packages				40	25	0	5	20	5	5	1				25		2
AA - Procedure: Safety management procedures			25	15	20	0	2	20	25	5	10				25		2
AA - Procedure: Administrative procedures				20		2	0	10	25	15	1				0		1
AA - Tests or Experiments Not Described in Existing DSAs				0		0	0	0	0	1	0				2		1
Screening			25	60		10	25	35	10		66				50		0
Expert USQDs**			25	30	10	20	40	50	15		17				50		2
Clarification of Sufficient Level of Documentation in Applicability Assessments				0	60	0	0	0	10						0		2
...Level of Documentation in Screening				60	60	0	0	35	20		6				25		3
...Level of Detail in Standard USQD				20	20	0	0	10	15	2	0				25		0

*Note: These statistics reflect that some sites have already implemented the improvements discussed in this white paper. Furthermore, some of the savings are on the backend (e.g., minimizing time spent with addressing audits) rather than the front end of actually applying the USQ process.

**Note: For some waste sites, USQDs do not generally require more than a few hour to prepare. As a result, expert USQDs are not expected to be a significant improvement at some waste facilities.