

The Lost Intent of TSRs and TSR Violations

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History/Background

- Increase in TSR violations since 2004
- Causal analysis – human error, inadequate communications, management issues
- Analysis indicated more subtle issues
 - Lack of consistency
 - Level of safety significance
 - Definition of violation for admin controls

Types of TSRs

- Safety limits
- Limiting Conditions for Operation
- Administrative controls
 - Programmatic (broad, no specific limits)
 - Specific (SACs)
 - MAY be designated if:
 - it is identified in the DSA as a control needed to prevent or mitigate an accident scenario, AND
 - it would be a Safety Significant or Safety Class function if provided by an SSC.
 - SACs typically include elements of ACs that are credited as part of the primary control set (e.g., primary Level of Control).
 - Example: A specific combustible loading limit (e.g., 5,000 wood lbs equivalent) vs. Fire Protection programmatic control.

Intent of a TSR

- Very little guidance
- DOE Guide 1186 – TSRs are intended to define the outer bounds of the safety envelope as defined in DSA
- DOE Guide 423.1-1 – “... TSRs represent the set of controls that are necessary to describe the bounds of safe operation.”
- Reality - The level of risk accepted by DOE
 - Still based on safety
 - More conservative than true safety boundary
- Analysis determines limits/required level of performance
 - Setpoints, levels, functional classification
- Protected by by TSRs:
 - Parameters (setpoints, levels, etc)
 - Time at risk (surveillance frequencies, time to fix)
 - Programs (e.g., crit, radcon, maint)

TSR Violations

- Violation should indicate confirmed operations outside the DOE-accepted risk, as defined by the TSRS.
 - Definition would not include “could/might have”
 - potential or unknowing operation outside of the safety basis (e.g., setpoints which drift outside of limits within calibration frequencies/ discrepant field conditions)
 - Speeding citation not given just because the speedometer is broke and it had potential to result in speeding!
- Declaration of Violation should also be a result of human error
 - Negative performance perception
 - Subject to penalty

TSR Violations/Definitions

- Safety Limit – exceed the limit
- LCO - Operation outside the LCO or the failure to perform the Required Action within the specified time constraints
- Specific Administrative Controls
 - A specifically credited control in the DSA is not met (e.g., Material at Risk limit)
 - A Required Action (or equivalent) is not performed
 - Some accepted amount of time at risk is exceeded
 - A violation is immediate upon discovery of the discrepant condition, provided an action is not included in the SAC.

TSR Violations/Definitions

■ Programmatic Admin Control Violation

- Not easily discernable/subjective
- Facility definitions not consistent

- Ex. 1 – “Failure to comply with a programmatic requirement. NOTE: Violations of this nature are characterized by **repeated deviations** of noncompliance or neglect for a program. *Individual deviations are not considered to be TSR violations.*”
- Ex. 2 - Failing to comply with an Administrative Control programmatic requirement. NOTE: Violations of this nature are typically characterized by **programmatic noncompliance or neglect** for observance of Administrative Controls. *Deviations within the implementing programs for Administrative Controls are not considered to be TSR violations.*
- Ex. 3 - **The intent of a referenced program is not fulfilled.** *To qualify as a TSR violation, the failure to meet the intent of the referenced program would need to be significant enough to **render the DSA summary invalid.***
- Ex. 4 – Violation occurs as a result of “failure to comply with a TSR administrative control requirement that **results in a USQ** or is determined by the contractor or DOE to represent a **significant violation** involving programmatic noncompliance or repeated neglect.”

TSR Violations/Definitions

- All definitions taken directly from DOE-approved TSRs
 - Several (not all) violation definitions explicitly state that an administrative control TSR violation cannot be claimed for any single deviation
 - Violation at one facility would not have been a TSR violation at another facility
 - One facility definition of a TSR violation does not make the “violation cannot be single deviation” statement.
 - Facility was subject to TSR violations for single program deviations

DOE Guidance for Admin Control Violations

■ Safety Limits, LCO, SAC violation definitions consistent, non-subjective

■ Administrative Control Violations - LTA

–DOE TSR Development Guide (423.1-1)

■ “when the intent of the program is not fulfilled”.

■ “the failure to meet the intent of the referenced program would need to be significant enough to render the DSA summary invalid.”

–The DOE-Standard on DSA preparation (3009)

■ “discrepancies in a program would not constitute violation of the safety basis unless the discrepancies were so gross as to render premises of the summary invalid.”

–DOE Standard on Specific Administrative Controls (1186)

■ “a TSR violation of a safety management program can only result from a gross program failure, significant enough to render the DSA summary invalid”.

Programmatic Admin Control TSR Violation

- Should be significant enough that remaining programmatic controls could be inadequate to prevent a significant hazardous event.
- If no immediate action required and negligible potential for a significant hazardous event, a programmatic AC TSR violation should not be considered to have occurred.
- Programmatic AC TSR violations are being declared even though the event has little or no impact on safety margin and immediate actions are not warranted.

SUMMARY AND CONCLUSIONS

- The concept and definition of a TSR are not clearly defined, understood or consistently applied.
- The “message” which a TSR violation is intended to convey (i.e., exceeded the safety boundary) is not defined or understood. This results in personal interpretation and the declaration of TSR violations which are not violations.
- The definition of a programmatic administrative control TSR violation is inadequately defined. Terms used in defining a violation are subjective (e.g, significant violation), not defined or understood (e.g., DSA summary), and inconsistent.
- Admin control violations are often based on a single non-compliance issue with minimal impact on facility safety. If a single non-compliance is significant enough to warrant a TSR violation, that particular element should be elevated to a SAC.
- Administrative controls are not adequately derived or written. If specific program elements are credited, they are often not identified in the hazards analysis or carried through to the DSA and TSR documents as SACs.
- Some administrative TSR controls are overconservative. TSR violations are declared when multiple additional controls (i.e., defense in depth) remain in place and there is no significant challenge to safety, or even the safety basis boundary.

Recommendations

- Clarify and document the intent of of TSRs (e.g., the safety basis boundary has been challenged and/or immediate action is warranted).
- Request that DOE provide clarification on the meaning of terminology used in defining TSR violations (e.g., DSA summary)
- Develop guidelines to be used to assist in determining whether a TSR violation has occurred, especially in regards to programmatic ACs.
- Develop a consistent site definition of a TSR violation, particularly as applied to TSR programmatic administrative controls.
- Determine the role of “defense in depth” as it pertains to the need for TSRs and what, if any role, it may have in the declaration of a TSR violation (e.g., if control(s) remain, there has been no violation).

Recommendations

- Provide training to the developers of safety basis documentation on the following aspects of administrative control TSRs:
 - the need to specifically identify those elements within a safety management program which are being relied upon to maintain safety;
 - carry-through of those elements credited in the hazards analysis to the DSA and TSRs as SACs,
 - use of the LCO format for SACs to the greatest extent practical
 - consideration of other defenses when choosing or developing TSRs,
 - defining an appropriate level of conservatism into TSRs, and
 - development of clear and consistent guidance for determining when a violation has occurred for a programmatic administrative control TSR.

- Develop a process by which the declaration of a TSR violation can be appealed, rather than be subject to the sole discretion of a single individual (i.e., DOE facility representative).

TSR Violation Considerations

- A violation of a programmatic administrative Technical Safety Requirement may have occurred if:
 - A Safety Class or Safety Significant function was rendered ineffective
 - There were no remaining controls to prevent harm to the public, worker or the environment
 - Immediate action was required to place the facility in a safe condition
 - The “program” clearly failed to meet the intent of the program as described in the DSA description of the program.
 - An administrative control element specifically credited in the TSR description (i.e., specific administrative control) failed
 - The safety basis boundary was clearly exceeded

 - DOE says it did!

Examples

- Failure of a credited design feature due to anticipated initiator
 - Not a TSR violation if:
 - preventive controls (e.g., surveillances) had been met
 - mitigative controls (required actions) associated with the event had been properly implemented.
 - Risk of failure was accepted by DOE as evidenced by approval of the safety basis.

- Failure of a credited design feature due to unanticipated initiator (e.g., discrepant field condition)
 - Not a TSR violation
 - No control failure (No credited controls)
 - No confirmed evidence of exceeding DSA boundary
 - Discrepant conditions are expected event
 - Handled with PISA (Potential Inadequacy in the Safety Basis)
 - PISAs are an anticipated event, or risk, with DOE-approved actions required to be taken upon their discovery
 - Should not be considered a TSR violation, unless appropriate actions are not taken.

Non-Safety TSR

- Administrative Control limits 55 gallon drum Fissile Material to 485 FGE Pu-239
 - Several TSR violations due to legacy drums exceeding limit
 - Analysis shows several drums w/730 grams w/optimal moderation/reflection/geometry OK
 - Optimal array is BEU
- TSR violation (even if several drums) is no challenge to safety

TSR Violation Examples

- SRS Legacy waste drum removed from an array,
 - segregated (increased level of criticality safety),
 - Moved to a Hazard Category (HC) 3 facility.
 - Found to contain HC 2 levels of fissile material

- TSR violation declared based on exceeding the HC3 limit. However,
 - No challenge to safety,
 - No increase in risk (risk reduced by removing the drum from the array)
 - No program failure
 - No human error
 - Other controls remained in place which provided additional barriers to any possible challenge to safety.
 - Could/should have been addressed using the USQ process (i.e., Potential Inadequacy in Safety Documentation) ?

- Would not be a violation at the Idaho Completion Project,
 - 380 gram limit on individual drums
 - If exceeded, the drum must be segregated and evaluated.

SW Example (cont.)

- Administrative Control limits 55 gallon drum Fissile Material to 485 FGE Pu-239
- Analysis shows several drums w/730 grams w/optimal moderation/ reflection/ geometry OK
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Example

- Facility credits the generic preventive maintenance program in the TSR
- No significant elements, or “administrative features” of the program identified or mentioned in the TSR.
- Discussion in the DSA identifies specific features of the program which are being relied upon (e.g., specific equipment which relies on the preventive maintenance program)
- Hazard Analysis does not mention the preventive maintenance program; intent cannot be determined
- As written, any deviation from the preventive maintenance program could be interpreted as a potential TSR violation

- Two Significance Cat 4 TSR violations in 2005 (conductivity probe functional checks)