Other Information About Confirmatory Analysis

Abbreviations

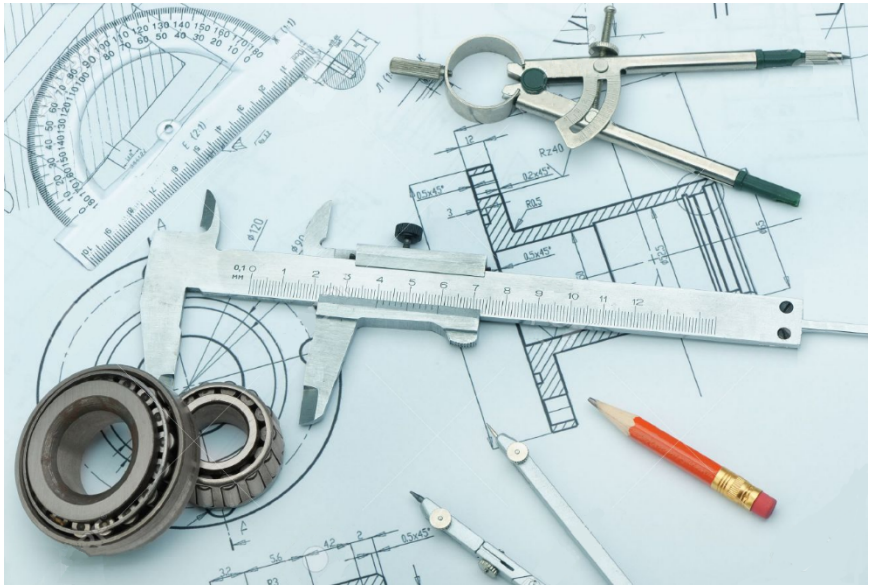
BTP – Branch Technical Position
DSRS – Design Specific Review Standard
ESRP – Environmental Standard Review Plan
RES – Office of Nuclear Regulatory Research
SSC – Structures, Systems, and Components
V & V – Validation and Verification
QA – Quality Assurance
RG – Regulatory Guide
ISG – Interim Staff Guidance
SRP – Standard Review Plan
NRO – Office of New Reactors

Where can you find more information?

✓ Talk to your Branch Chief, or a Senior Technical Reviewer
✓ Review relevant SRP sections and/or other NRC guidance, as appropriate

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Confirmatory Analysis Job Aid



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Confirmatory Analyses

- ✓ Confirmatory analyses are used by the staff to obtain insights on the results of the licensee's/applicant's analyses and provide additional confidence behind the staff findings.
- ✓ Confirmatory analyses are sometimes referred to as confirmatory calculations, independent evaluations, independent analyses, or independent assessments.
- ✓ Confirmatory analysis is a useful method for the staff to:
  - Help understand the proposed design to help assess its conformance to the NRC's guidance and compliance with NRC's regulations;
  - Help determine if the licensee's/applicant's analyses and results adequately reflect design descriptions and design features presented in the application; and
  - Help inform the determination of whether the method and/or assumption used by the applicant or licensee conform to NRC guidance and comply with NRC regulations.
- ✓ Confirmatory analysis can be performed in many ways. For example:
  - Performing an analysis using other industry accepted software such as MATLAB, Microsoft Excel, ANSYS, and GIS when standard code packages are not used.
  - Extracting design parameters presented in the application to generate an input file for use in an industry standard code or NRC-endorsed code, and comparing the staff's results to the licensee's/applicant's results.
  - Evaluating the acceptability of the licensee's/applicant's technical basis for an alternate method (i.e., modified industry standard or applicant code) by reviewing the input/output files, sensitivity analyses, executable codes, and necessary documentation (e.g., V&V and QA documentations and calculation packages).
  - Performing an analysis using RES staff and/or contractors when NRO does not have the resources or experience to perform the analysis.

Criteria for Confirmatory Analyses

- ✓ Confirmatory analyses are performed using guidance provided in relevant documents such as RGs, BTPs, NUREGs, ISGs, SRPs, DSRSs, and ESRPs, as well as technical judgment.
- ✓ Confirmatory Analysis is conducted when:
  - Novel design features are involved and sufficient historical regulatory basis associated with NRC review and approval of such design features does not exist;
  - When the licensee/applicant deviates from an acceptable method (i.e., proposes an alternative method) cited in NRC guidance and the licensee's/applicant's design bases documents, and justification provided within the application raises fundamental concerns;
  - When the staff determines it is necessary to confirm the licensee's/applicant's prediction of responses to postulated accidents for an SSC; and
  - When the staff determines it is necessary to confirm the licensee's/applicant's conformance to NRC guidance and compliance with NRC regulations.
- ✓ The Branch Chief should approve the need for a confirmatory analysis and why the staff could not rely on information presented in the application or why it is more effective to conduct confirmatory analysis.

Best Practices

- ✓ Staff should have a clear and understandable regulatory basis (i.e., regulatory requirement or SRP acceptance criteria) for the information being confirmed by a confirmatory analysis.
- ✓ Staff should evaluate and understand the basis of the design parameters and assumptions presented in an application before performing a confirmatory analysis.
- ✓ Staff should evaluate the need for a confirmatory analysis taking into account SRP guidance and using sound technical judgement based on factors such as:
  - Prior NRC experience and regulatory decisions associated with similar SSCs being evaluated;
  - Amount of margin in the referenced analysis results;
  - Conservatism in the referenced analysis assumptions;
  - The degree to which the staff understands the bases of the assumptions used to establish conservative values and the resultant calculated margin;
  - Consistency of applicant's analysis with NRC guidance and consideration of other similar approved designs;
  - Degree of conformance to NRC guidance, and compliance with NRC's regulations;
  - Safety significance of the SSC;
  - Whether the applicant or licensee is using an NRC-approved methodology; and
  - Discussion with Branch Chief.
- ✓ Staff should not perform confirmatory analyses in all cases, simply for the sake of conservatism or perceived verbatim adherence to the SRP - in cases where the SRP indicates that the staff should perform a confirmatory analysis.
- ✓ Staff should follow applicable NRC guidance when performing a confirmatory analysis to minimize unnecessary work.
- ✓ Staff should be cognizant of the limitations, assumptions, and applicability of the calculational model or code before using it to perform a confirmatory analysis.
- ✓ Staff should use the request and approval process outlined in NRO-COM-106 when requesting RES support for confirmatory analysis.
- ✓ Staff should perform confirmatory analysis for a sample (i.e., not all cases or scenarios) of the licensee's/applicant's analyses.
- ✓ Staff should use best-estimate systems and phenomenological modeling and assumptions when performing confirmatory analysis.

Things to Avoid

- ✓ Using overly conservative assumptions/methods to conduct the confirmatory analysis.
- ✓ Conducting a confirmatory analysis for a design parameter that has already been approved for a similar design. Assuming that the technical reviewer understands all of the underlining assumptions and models that went into the original analysis then reconsider the need for performing a confirmatory analysis.
- ✓ Basing regulatory findings solely on the results of confirmatory analyses. If the staff identifies significant discrepancies between the results of its confirmatory analysis and those presented in the application, the staff will need to issue an RAI for the licensee/applicant to clarify the discrepancy and docket pertinent information to support the staff's review. The staff should only base their conclusion on docketed information provided by the licensee/applicant.