



APPLIED ANALYSIS CORP.

NUCLEAR DESIGN & ANALYSIS CAPABILITIES

The technical staff of Applied Analysis Corp. (AAC) in Reading, PA has engineering and management expertise in the design, safety analysis, program management, regulatory compliance, and technical audit support of commercial nuclear power plants. Senior staff members average nearly 30 years of experience in the design and analysis of nuclear systems.



The staff experience has been accumulated through years of nuclear plant project support activities including original PWR and BWR system's design, design basis reconstitution, power uprate design and analyses, design modifications, Environmental Qualification (EQ), systems simulation and analysis, software engineering and quality assurance, safety reviews, and operability determination support, to name a few.

Thermal-Hydraulic Analysis of Systems and Components

Our staff has hands-on experience with numerous state-of-the-art computer codes for fluid systems analysis, transient analysis and Chapter 15 accident analysis and offer services in:

- Thermal-hydraulic analysis of nuclear reactor and process systems. Fluid system thermal-hydraulic analysis including hydraulic modeling and transient analysis of single and two-phase systems. Water hammer analysis, fluid induced pipe loads calculations, and root cause investigations. Steady state fluid network analysis experience includes **Pipe-Flo** code applications.
- Nuclear reactor thermal-hydraulic analyses associated with postulated accidents and transients including containment and sub-compartment pressure and temperature response, system's thermo-fluid response to pipe breaks or single failures, etc. Experience with codes such as **GOTHIC** and **RELAP5** as well as earlier design basis codes such as CONTEMPT, COMPARE, etc. Fluid-structure interaction calculations, such as jet impingement, related to pipe breaks. Also, BWR hydrodynamic suppression pool loads analyses and evaluations.
- Thermal system and/or component analysis. Multi-dimensional/combined mode steady-state and transient heat transfer analysis. Equipment transient thermal lag analysis. Post-accident and loss of HVAC room transient temperature calculations. Heat exchanger performance calculations. Ultimate heat sink thermal design and analysis including cooling ponds and spray ponds. Safety related refrigeration system's performance analysis.
- Thermo-fluid calculations for piping system erosion/corrosion programs.

Radiological Engineering

Experience in all areas of shielding calculations. Source term development (**ORIGEN**). Direct and scattered dose analysis. Deep penetration gamma and neutron shielding. Gamma air scattering (skyshine) dose calculations. Equipment qualification dose analysis. Knowledge of general purpose point kernel computer codes (**MICROSHIELD**, SDC, SPOT, QAD, etc.), discrete ordinate codes (ANISN, DOT), and skyshine codes (MICROSKYSHINE, GGG, SKYSHINE). Have performed shielding analyses for many commercial nuclear power plants and on-site waste storage facilities.

Radiological safety calculations. Normal operations (Appendix I – GALE, NRCDOSE) and post-accident dose assessments. Extensive experience in Alternative Source Term (AST, RG 1.183) applications using the **RADTRAD** radiological assessment code. Radionuclide transport calculations. Knowledge of relevant regulatory requirements for plant design and operations including system design, accident analysis and effluent release. Atmospheric dispersion calculations per RG 1.195 and relevant codes such as **PAVAN** and **ARCON96**. See the AST experience brochure in our website for details.

Power Uprate Programs

Power uprate impact studies. Uprated power system safety analyses and reviews. Experience with MUR, stretch, and extended power uprates. See the Power Uprate experience brochure in our website for details.

Design Basis Programs

Development and implementation of design basis and design basis reconstitution programs. Preparation and review of design basis documents including analyses/calculations in support of design margin evaluations.

Technical Training/Technology Transfer

Technical seminars and technology transfer programs in the areas of thermal-hydraulics, radiological engineering and nuclear safety analysis. See the Engineering Mentoring brochure in our website for details.

Scientific Software Engineering

Scientific software programming. Experience with compiled languages such as FORTRAN and C. Software quality assurance (SQA) activities such as verification, validation, and preparation/review of SQA manuals and procedures.

Simulation Software Engineering

Development and testing of process and power plant real-time simulators software. Process systems experience includes fluidized bed catalytic cracking units (FCCU) and natural gas extraction plants. Power plant systems experience includes feedwater, condensate, cooling water, and service water.

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