RTDP/RTS&ESFAS

Beaver Valley License Amendment Request

- **Goals**
  - **-Supports 1.4% Uprating Project**
  - **-Improves DNB Margin**
  - **-Addresses Industry Issues (e.g. TB-97-01)**
  - **-Removes 1998 BCO's**
  - **-Provides new baseline for the current setpoint uncertainties and Transient Analyses (DNB events)**
  - **-Allows optimization of cycle-specific Technical Specification parameters**
- **Aligns BVPS Setpoint requirements with ISTS**

RTDP/RTS&ESFAS

Beaver Valley License Amendment Request

- **Covers Five Areas:**

  -RTS/ESFAS Setpoints & Allowable Values
  -RTDP Methodology Implementation
  -Relocation of Cycle Specific parameters to COLR
  -Relocation of Trip Setpoint values to LRM
  -Miscellaneous changes

Differences between CLB and Present LAR

- **Changes to Algorithms**
- **Application of LSSS**

RTS/ESFAS SETPOINT METHODOLOGY

- **Consistent with previously approved methodology as described in WCAP-11419 (Unit 1) and WCAP-11366 (Unit 2)**

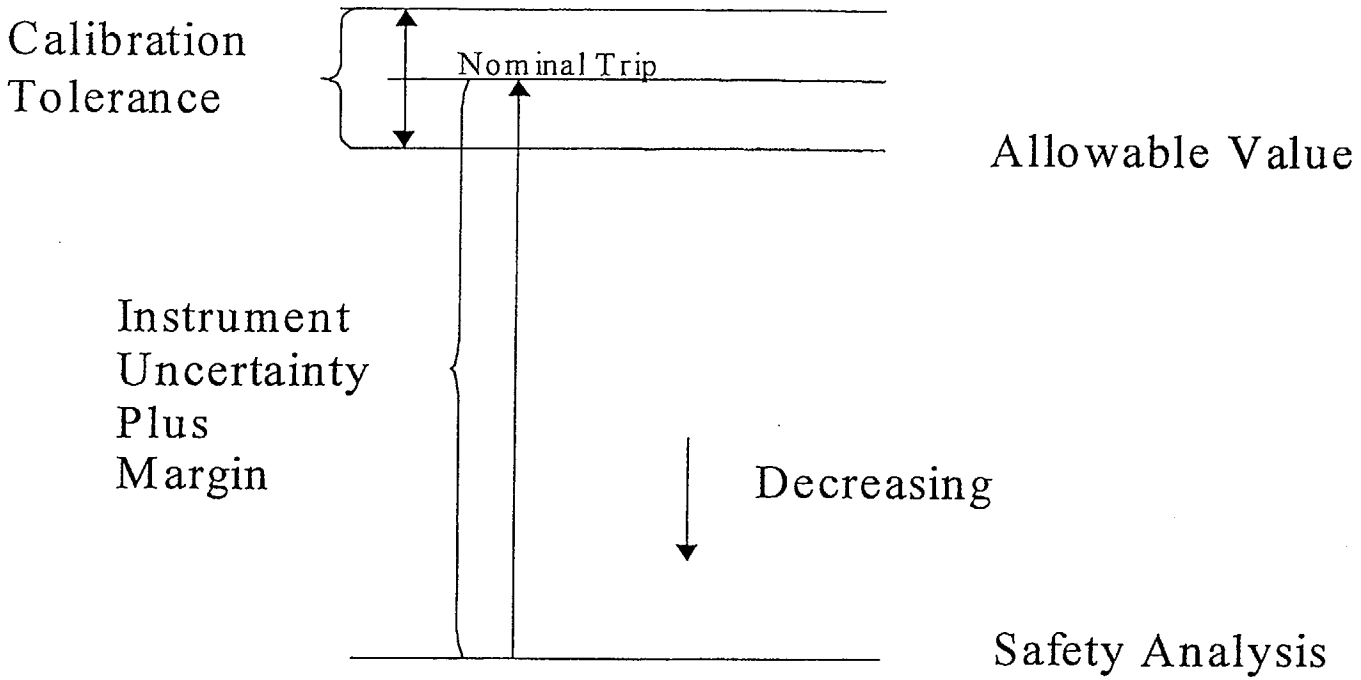
- **Limiting Safety System Setting (LSSS) is the Allowable Value**

- **Methodology conforms with Reg. Guide 1.105, Revision 3**

Treatment of RTS/ESFAS Setpoint Nominal Value

- **Ensures compliance with our Design Analysis**
- **Addresses Verbatim Compliance**
- **Follows Other Plant(S) NRC approved**

REACTOR TRIP SETPOINT



Reactor Trip System/Engineered Safety Features Actuation System

(Example)

Allowable Value

Allows for "As-Left" Deviation from the Nominal Trip Setpoint

Criteria Used by Operations and Maintenance Personnel to Evaluate "As-Found" Nominal Trip Setpoints

Nominal Trip Setpoint

Value at Which the Bistable is Set, as Accurately as Reasonably Achievable

Thermal Design Procedures

- Standard Thermal Design Procedures (STDP)
  - Reactor parameters are chosen such that there is ~ 100% probability that core FSARs limiting values will be met (i.e., lowest flow, highest temp, highest power, etc.) Design limit DNBR = correlation limit
- Improved Thermal Design Procedure (ITDP) – WCAP-8567
  - Design limit DNBR chosen with reactor parameters at nominal values. Variations (uncertainties) in parameters are considered in generation of this limit DNBR
- Revised Thermal Design Procedure (RTDP) – WCAP-11397
  - Extension of ITDP where DNBR correlation statistics are also combined into calculation of design limit DNBR
- Mini-RTDP
  - Plant System uncertainties are excluded from the statistical combination process (e.g. Plant system uncertainties on reactor power, flow, temperature, pressure and bypass flow are excluded).

RTDP Methodology

- **Submitted on March 16, 1987**
- **Approved on January 17, 1989**
- **Revised the previous ITDP Methodology treatment of uncertainties**
- **26 Plants have employed RTDP**
- **Beaver Valley is currently a Mini-RTDP plant**

RTDP Methodology

RTDP Methodology is used for predicting the DNBR design limit in Westinghouse PWRs.

Is a modification of the existing ITDP Methodology

Methodology employs a 95% confidence level

System and correlation uncertainties are statistically combined rather than deterministically.

Provides a more realistic prediction of the DNBR limit which satisfies the design criterion.

RTDP Methodology

- **Satisfies design criterion that protect against DNB**
- **Criterion is that DNB will not occur on the limiting fuel rod for a Condition I or Condition II Event.**