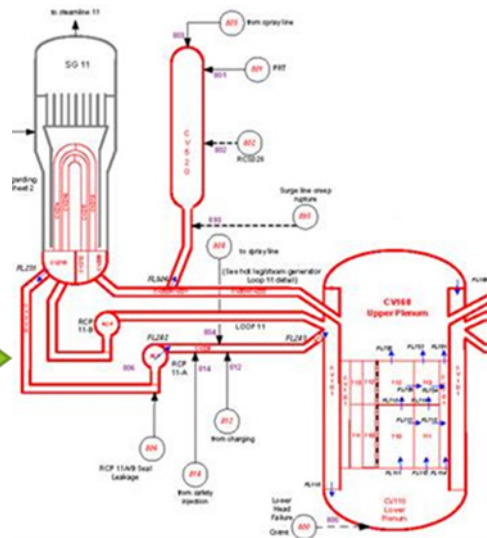
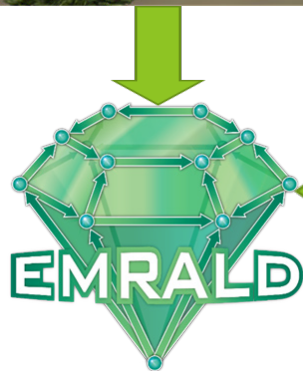
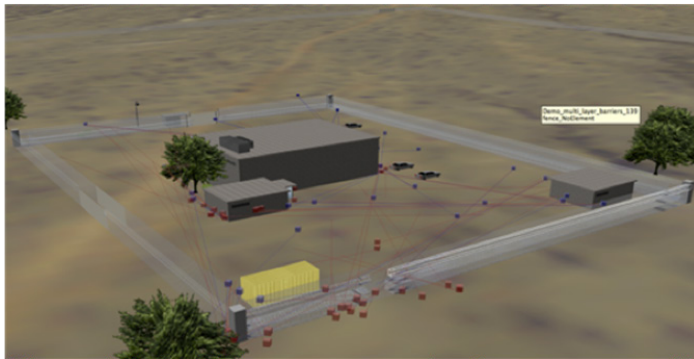




# Palo Verde Risk Informing Physical Security Program Changes with EMERALD



# Simulation Process Results

Reviewed scenarios, for all that would benefit from manual TDP operation or Protection Pump.

- ▶ ~50% of scenarios benefited
- ▶ Developed exaggerated scenarios for each. (Average 41.3% adversary success)
- ▶ Average 12.5% adversary success with added protection strategy
  - ▶ Research resulted in opportunity for a 29% margin for post reduction or operational flexibility
- ▶ Performed reduction process

**Response force posts reduced by ~20%**

# Operational Impact

- ▶ No change in equipment tie-in locations for FLEX
  - ▶ B.5.b locations would require additional analysis, guidance, equipment
- ▶ Purchase identical equipment to FLEX
- ▶ Minimal administrative changes to Abnormal Operating Procedure (AOP) for security events
- ▶ Additional risk margin can be gained by maximizing SG level before and/or after trip
  - ▶ No evaluation currently in progress for higher pre-trip/post-trip SG level or higher feedrates
- ▶ No change to credited operator actions during the security event (before the “all-clear”)
  - ▶ Potential B.5.b connection guidance needed
- ▶ Fire water for SG makeup via B.5.b not a viable option for Palo Verde - Equipment outside Protected Area



# Palo Verde Cost Estimates for Increased Margin

- ▶ Two “Security Pumps” for SG Makeup \$500K
- ▶ New Bullet Resistant Enclosure for “Security Pumps” \$500K
- ▶ Yearly PM cost for new SG Makeup Pumps \$50K
- ▶ Cost of Operator Training and Procedure changes expected to be minimal due to leveraging existing guidance for “FLEX” SG Makeup Pumps.
- ▶ Estimated time to recoup initial and ongoing investment is conservatively estimated to be 1-2 years.



Questions?

