The A to Z of Operating Experience Data Collection and Usage to Improve PRA Realism

Collection of Reliability Data and Event Reports

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Primary Data Source for Events

- US Nuclear Regulatory Commission (NRC)
  - Licensee Event Reports (LERs)
    - Reports required to be submitted to the NRC per 10CFR50.73
    - Event Report Guidance provided in NUREG-1022
    - Primary source of initiating events information
    - Significant safety system failures are reported
  - Event Notification Reports (ENs)
  - Inspection Reports (IRs)
  - Monthly Operating Reports (MORs)
    - Primary source of operating time data
    - Required by NRC Generic Letter 97-02

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Primary Data Source for Reliability Data

- Institute for Nuclear Power Operations (INPO) – An organization to promote the highest levels of safety and reliability in the commercial nuclear power plants
  - Equipment failure data captured in the INPO Consolidated Events Database (ICES), formerly the Equipment Performance Exchange System (EPIX)
    - Supports data for the Maintenance Rule, Mitigating Systems Performance Index (MSPI) and Reactor Oversight Process (ROP)
    - Data is proprietary, only accessible by INPO members
    - Data is input by each utility in the U.S.
    - The amount of data provided varies by utility. All provide required MSPI data, but some provide significantly more
    - Also includes demand and run time data for many systems

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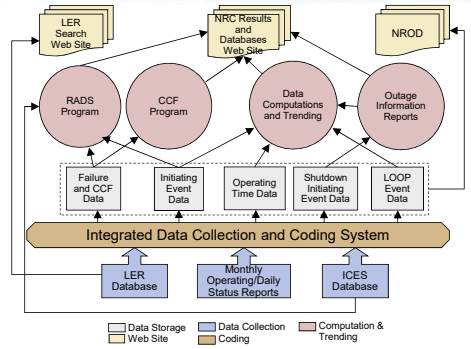
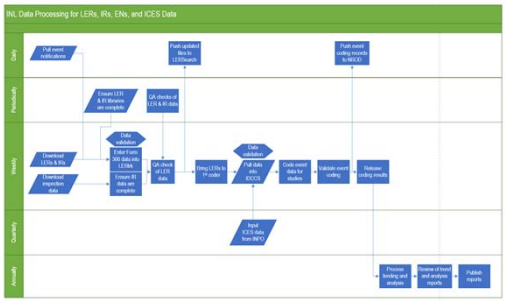
Overall INL Data Process



Timeline for Processing Data



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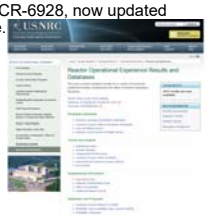
Publically Available Reports

- Reactor Operational Experience Results and Databases http://nrcoe.inl.gov/resultsdb
  - Industry Average Parameter Estimates.
    - Supports industry average component reliability data for Probabilistic Risk Analysis (PRA) studies. Primarily for the NRC's Standardized Plant Analysis Risk (SPAR) models.
    - Originally published in NUREG/CR-6928, now updated periodically on the NRC website.
  - Component Performance Studies
  - System Studies
  - Common-Cause Failure Insights
  - Loss of Offsite Power
  - Initiating Events
  - Operating Time



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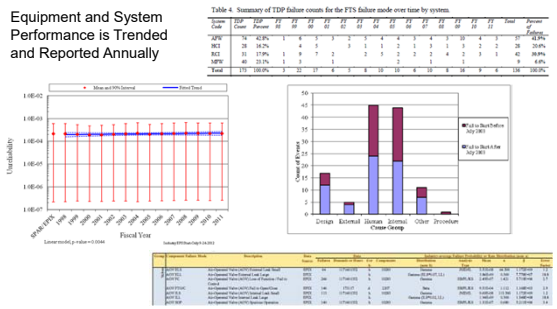
Examples of Publically Available Report Content

Equipment and System Performance is Trended and Reported Annually



NRC Reactor Operating Experience Database (NROD)

- A website to provide access for NRC staff and industry personnel to search and view INL coded event data directly
- Web address https://nrod.inl.gov
- Links to an online version of the Reliability and Availability Data System (RADS)
- Since it contains proprietary data, access is restricted to INPO members and NRC staff
- Currently, over 140 registered users

LER Search

- A website to provide access for the public to more effectively search and view Licensee Event Reports (LERs) and Inspection Reports (IRs)
- Web address https://lersearch.inl.gov
- Easier to use than ADAMS
- Currently includes over 54,000 LERs
- Includes LERs since 1980
- Allows searching by date, plant, reactor type, region, reportability, mode or keywords
- Results can be exported to MS Excel

Data Quality Controls

- A user's guide describes each study and provides guidance for filling out each field in the IDCCS
- The IDCCS program utilizes numerous lookup tables and automated checks to ensure data consistency
- Records are entered by qualified coding engineers
- Each record is independently checked by a second qualified coding engineer
- The IDCCS software randomly selects a sample of records for an independent quality review semi-annually

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Conclusion

- Idaho National Laboratory collects and maintains operating experience data on behalf of the U.S. NRC
- The results of this ongoing work were generally provided to the public through a series of NUREGs and currently through periodic web reports on the NRC's website http://nrcoe.inl.gov/resultsdb
- Several databases and data analysis tools are also provided for specific purposes. The operating experience data and data analysis tools provided by the NRC are available to support various PRA modeling needs

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