NRC USES OF EPIX DATA

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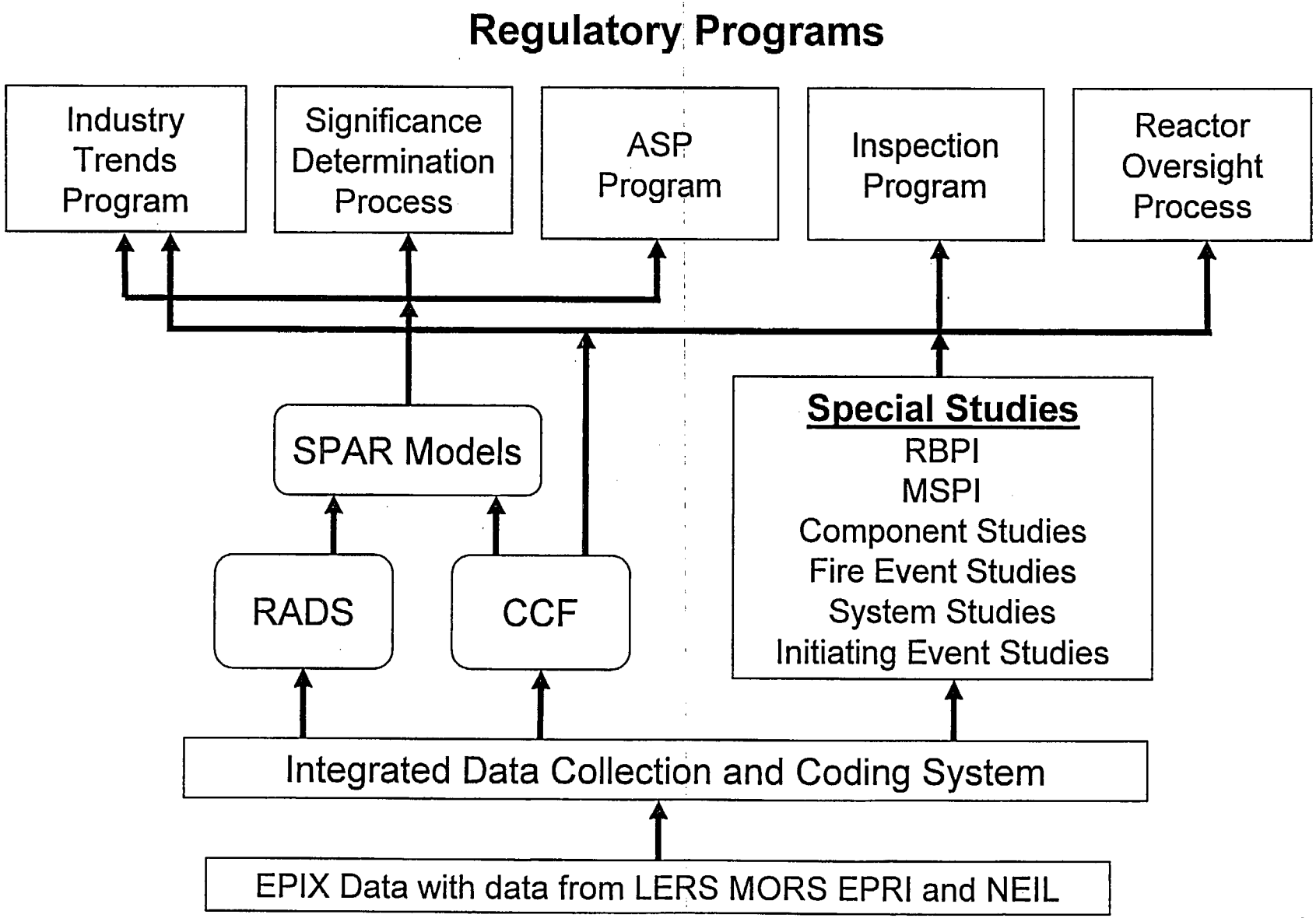
NRC USES OF EPIX DATA 2003

- Special Studies
- Input to NRC Systems and Models to Provide Risk Information for NRC Regulatory Programs
- Systems and Models Support NRC Regulatory Programs

EPIX DATA IN THE NRC REGULATORY PROCESS



EPIX DATA USED IN SPECIAL STUDIES

- Risk-based performance indicator (RBPI) development
  - SECY 99-007 stated the need to further refine reactor oversight process performance indicators
  - NRC staff and contractors developed RBPIs to potentially enhance the ROP; NUREG-1753 completed November 2001
  - EPIX data were the primary source for development of RBPIs

EPIX DATA USED SPECIAL STUDIES (continued)

- Mitigating System Performance Index Pilot
  - During the first two years of initial ROP implementation, staff and industry identified problems with current ROP performance indicators and made several changes
  - A working group was formed to address these problems and develop new/revised performance indicators
  - Follow on to risk-based performance indicators development above

EPIX DATA USED SPECIAL STUDIES (continued)

- EPIX data have been used
  - as the source of "generic data" to establish equipment baseline performance
  - to develop "prior distribution" for Bayesian updating with plant- specific data
- EPIX/CDE will be priminary source for reliability and availability data used to verify plant specific performance

EPIX DATA USED SPECIAL STUDIES (Continued)

- Component Studies
  - Used EPIX data along with NPRDS and LER data on MDPs, TDPs, MOVs, and AOVs in major risk-significant systems
  - Used ESF and surveillance test demands and failures on these demands to estimate the probability of failure on demand by system, plant and by year
  - Compared results with PRAs and IPEs

EPIX DATA USED SPECIAL STUDIES (Continued)

- Fire Events Studies
  - EPIX data plus data from NPRDS, LERs, and NEIL were used to produce "Fire Events – Update of U.S. Operating Experience, 1986-1999," RES/ S02-01, Vol. 1
  - Fire frequencies and trends by plant area

INPUT TO NRC SYSTEMS AND MODELS

- Reliability and Availability Data System (RADS)
  - System uses EPIX failures and demands exclusively to estimate the probability of failure on demand and failure to run rates for major risk-significant components in risk-significant systems

- Common Cause Failure (CCF) Database
  - Failure records from EPIX, NPRDS, and LERs are reviewed to code common cause failure events
  - Produces common cause failure parameters
  - Database available to NRC staff and licensees

INPUT TO NRC SYSTEMS AND MODELS (Continued)

- Integrated Data Collection and Coding Systems (in development)
  - System being developed to consolidate and integrate LER data collection and analysis programs
  - Will use EPIX data to update the component studies and emergency diesel generator systems reliability study (NUREG 1715, Vol. 4, and NUREG/CR-5500, Vol. 5), and other system reliability studies

INPUT TO NRC SYSTEMS AND MODELS (Continued)

- Standardized Plant Analysis Risk (SPAR) Models
  - EPIX has already been used to update a few SPAR basic event probabilities (TDP FRS and FTR and others)
  - NRC wants to use EPIX data to make SPAR models as plant specific as possible

USE OF SYSTEMS AND MODELS IN NRC REGULATORY PROGRAMS

- Industry Trends Program
  - Monitor trends and report results to Congress, external stakeholders, and NRC management.
  - Monitor industry-wide safety performance and provide feedback to the ROP
  - Provide industry trends for component reliability, common cause failures, and fire events
  - Use SPAR models for the integrated initiating event performance indicator

USE OF SYSTEMS AND MODELS IN NRC REGULATORY PROGRAMS

- Reactor Oversight Process (ROP)
  - RADS used EPIX data in developing RBPIs and in supporting MSPI pilot

- Significance Determination Process (SDP)
  - SPAR models are used to
    - Evaluate the significance of inspection findings in SDP Phase 3 by NRR and the Regions and
    - Assess risk significance of events to identify regulatory actions by NRR and Regions

USE OF SYSTEMS AND MODELS IN NRC REGULATORY PROGRAMS (Continued)

- Accident Sequence Precursor Program
  - Use SPAR models to review and evaluate operational experience to identify precursors to potential severe core damage sequences

USE OF SYSTEMS AND MODELS IN NRC REGULATORY PROGRAMS (Continued)

- NRC Inspection Program
  - Data from EPIX, LERS, input to the Integrated Data Collection and Coding System are being used to enhance and plan plant inspection focused on the risk-important systems and components
  - Provide insights from system and component performance studies and common-cause failures
  - Use EPIX to obtain plant-specific component failure information
  - Use EPIX to obtain component-specific failure details across industry

COMPARSION OF MSPI PILOT DATA AND EPIX

EMERGENCY DIESEL GENERATOR (3Q99 – 2Q 02)

EDG FAILURE MODE	PILOT PLANT DATA	EPIX/RADS DATA
Fail to start	7 failures/2533 demands	8 failures/2652 demands
Fail to load run	8 failures/2303 demands	7 failures/2625 demands
Fail to run	9 failures/9777 hours	5 failures/9384 demands

- On average for all plants in the pilot, the two sources agree fairly well
- However, if plant-specific comparisons are made, only approximately 50% of the failures match (i.e., the pilot plant lists a failure, but EPIX does not or vice versa)
- While EPIX can be used for industry wide performance, NRC is not yet able to use EPIX for plant specific analyses and applications.