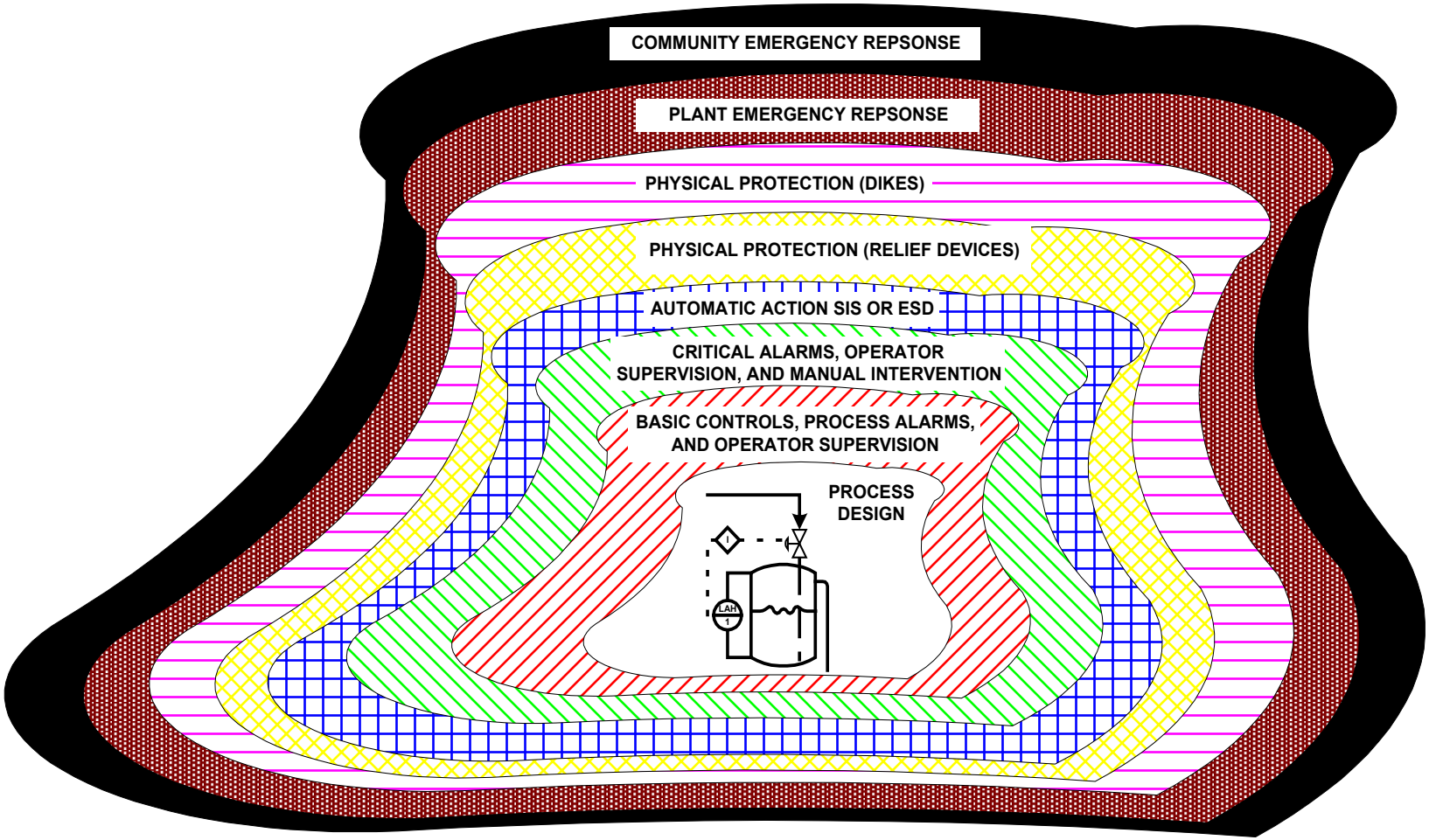
Establishing an Instrument and Analyzer Reliability Program In Support of Independent Protection Layers

Layers Of Protection Review



Reasons for I/A Reliability/Failure Data

- Provide accurate performance data to meet or exceed regulatory requirements as stated in OSHA 1910.119(j)(4) to conduct inspection, testing and documentation based on REGAGEP, i.e. IEC61511 for new and existing facilities
- Provide accurate data to maximize use of existing instrument systems (Grandfather Clause)
- Identify efficiency/reliability improvement opportunities
- Benchmarking with others in industry

Types Of Failure Data

- Random
  - --Age Related
  - --Bathtub Curve Characteristics
- Systematic
  - --Specification Errors
  - --Software Errors

Sources of Data and Degree of Trust

- Vendor Data
- Industry Published Data
- Internal Company Data

Implementing Internal Reliability Data Capture Program

- Long Term Effort
- Consistent Recording/Reporting Process
- Detailed Records Testing, Repair, Maintenance
- Large Population

Benefits of I/A Reliability Data Capture

- Verify and Improve the Reliability and Availability of SIS and BPCS IPL (proof testing and inspections)
- Identify and Eliminate “Bad Actor” Repeat Maintenance Offenders
- Identify/Reduce “No Problem Found” Work Orders
- Improve Cost Performance of Engineering and Maintenance
- Improve Overall Equipment Effectiveness

Steps In Implementing Internal I/A Reliability Data Capture Program

- Transfer Select Data from Design Engineering to Maintenance
  - Manufacturing Rep/Maintenance Rep

    --I/A Field Tag Number
    --Equipment Group Code for Technology Measurement Family
    --Equipment Type Code for Specific Measurement Principle
    --Manufacturer
    --Model Number
    --Location Description
    --Service Group (Pipe Spec)

Steps In Implementing Internal I/A Reliability Data Capture Program

- Upload Transferred Specification Data to CMMS
  - Manufacturing Rep

    --Plant Location

    --Production Unit

    --Process Unit

Steps In Implementing Internal I/A Reliability Data Capture Program

- Enter/Complete PPM Scheduled Services and Report Structure
  - PPM Tech, Reliability Engineer

    --Date I/A Placed Into Service

    --Cause/Repair Code Template

    --Data/Report Collection

Steps In Implementing Internal I/A Reliability Data Capture Program

- Operations Generation of I/A Associated Work Orders
  - Operations Leaders, Operators

    --Training/Expectations/Culture, One Work Order per I/A System

Steps In Implementing Internal I/A Reliability Data Capture Program

- Assemble Complete Job Packet
  - Gatekeepers, Job Planners

--Template/codes for identifying cause, reason and repair specific for the type of Instrument or Analyzer Technology

--Field documentation/recording form template

Steps In Implementing Internal I/A Reliability Data Capture Program

- Document Field Diagnosis, Repairs
  - I/A Mechanic or Technician

--Enter Failure/Repair Codes, other observations (failure mode) on field documentation template

Steps In Implementing Internal I/A Reliability Data Capture Program

- Enter Cause, Reason, Repair Codes in CMMS
  - Technician or Clerical Role

Steps In Implementing Internal I/A Reliability Data Capture Program

- Extract Data for Reliability Analysis
  - Reliability Engineer

--Random vs. Systematic

--Demand Rates

--Failure Rates, MTTF

--Failure Modes

--PFD

Steps In Implementing Internal I/A Reliability Data Capture Program

Not really “Rocket Science”

BUT…….

…..To some a real Culture Change

(details, details, details)