

NUMAC E-DCIS Platform Family

Safety-related and special nonsafety-related
Portion of DCIS
Nuclear Measurement, Analysis and Control
(NUMAC)

Safety Systems

- Reactor Trip and Isolation Function Panels.
 - > Reactor Protection System
 - > Leak Detection and Main Steam Isolation
 - > Suppression Pool Temperature Monitoring
 - > Anticipated Transient Without Scram (ATWS)
 - Standby Liquid Control System (SLC)
- Neutron Monitoring System (NMS)
 - > Startup Range Neutron Monitoring
 - > Power Range Neutron Monitoring

Safety Systems (cont.)

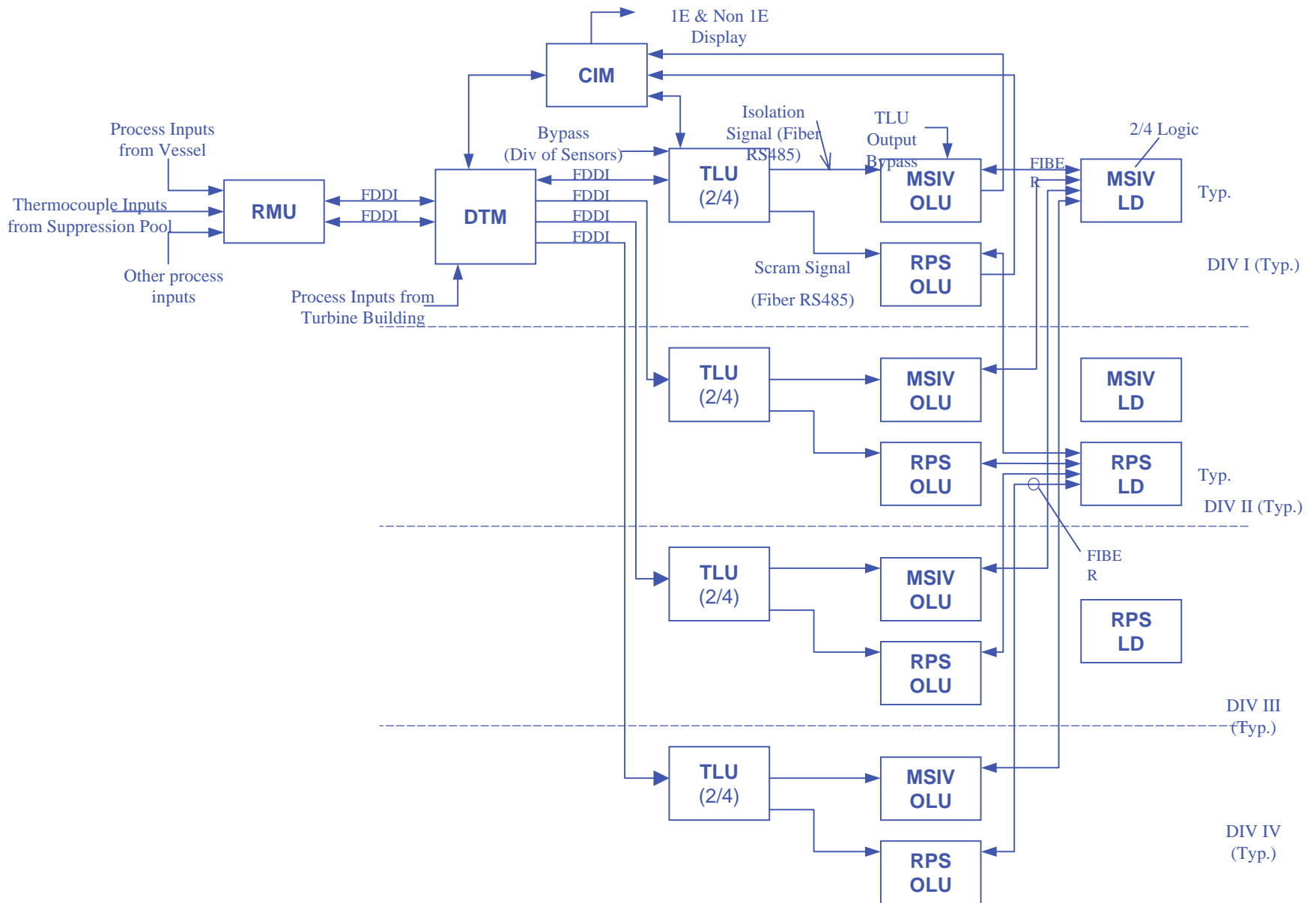
- Process Radiation Monitoring
 - > Logarithmic Radiation Monitoring
 - > Reactor Building Vent Radiation Monitoring

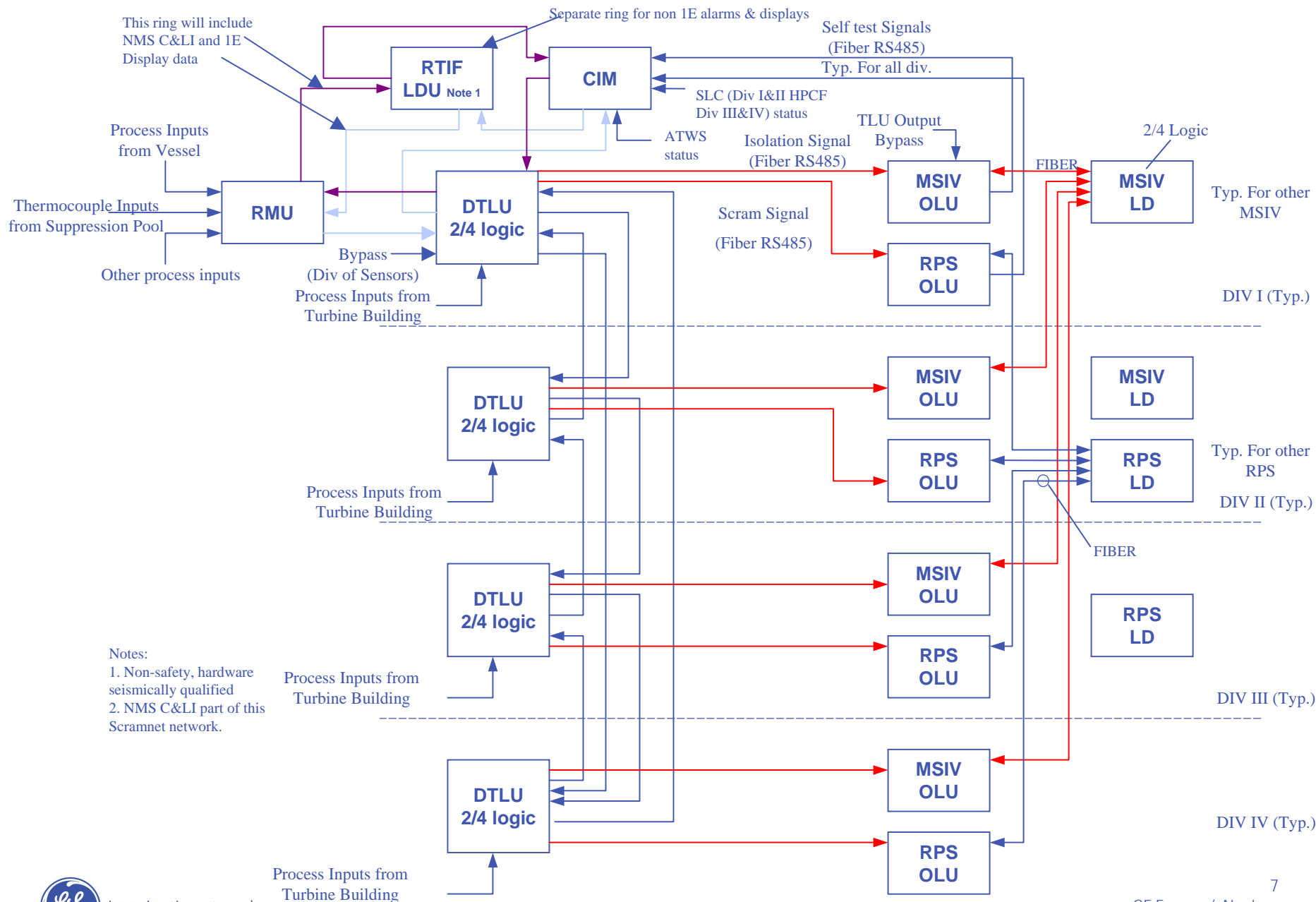
Non Safety Systems

- Reactor Control and Information System (RCIS) subsystems.
 - >Automatic Thermal Limit Monitor (ATLM)
 - >Rod Worth Minimizer (RWM)
 - >Rod Action and Position Information (RAPI) Signal Interface Unit.

SIMPLIFIED RTIF Block Diagram

Next Page Lungmen Design
Following page is future plants
(ESBWR, etc.)





NUMAC Design Features

- Proven and licensed Product line used in most BWRs across the world.
- High reliability. Modular hardware and embedded software design. Only application specific issues need to be reviewed by licensing agencies.
- Designed to enhance surveillance capabilities (self testing). Calibrations are done at the front panel of the instrument. Capability to place the instrument in an Inoperable state and change outputs to test downstream devices.
- Fiber optic bypass switches with interlock capabilities prevent bypass of more than one divisional function.

NUMAC Design Features (cont.)

- Sends alarms, self test status, and important variables to other DCIS systems both safety and non safety.
- All divisions are isolated from each other. Two out of four signals are transmitted to other divisions via fiber links.
- Diverse instruments (ATWS and diverse HPCF) are hardware based but each has a microcontroller that performs self test functions. This microcontroller is different from the microprocessor used in the standard NUMAC chassis and has no operating system.