SPEAR3 Booster Kicker
Upgrade Review

Control Chassis

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SSRL - EDM
Upgrade
Based on SD-444-290-43-C1
Two Chassis (Injection and Extraction)

Inputs
- Timer
- Enclosure Doors #1 & #2
- Air Flux in the enclosure
- HV Crowbar Interlock #1 & #2
- MPS
- Thyratron Choke #1 & #2
- HVPS Current
- HVPS Inhibit (Computer)
- Remote/Local
- Chassis Power up (stroke switch)

Outputs
- Signaling
  - Door Closed #1 & #2
  - HV Crowbar Interlock #1 & #2
  - High Voltage Permit
- Commands
  - High Voltage Permit
  - HV Permit Computer
  - Inhibit Crowbar #1 & #2
  - Power the Pulser #1 & #2 ON

Set Point and Read Back Voltage go directly to the Power Supply
Chassis Relay X PLC

- **Relay**
  - Low flexibility
  - Human resource to assembly
  - Difficult upgrade
  - Poor computer interface
  - Not friendly user interface
  - Complete System as Back UP
  - “Cheaper”

- **PLC**
  - Ease Documentation
  - Upgradeable
  - Embedded Computer Interface
  - Friendly Interface
  - Reliable
  - Password Protected
  - Modularity
  - “Expensive”
Control Logic

- Logix 5555
- 2 x Digital DC Input 1756 - IB16I
- 2 x Digital Contact Output 1756 – OW16I
- 7 Slot Chassis
- PanelView 600 (Using DF1 Interface)

Ancillary Circuits

- 2 x 24 Vdc Power Supplies
- 4 x 5 Vdc, 3 A Power Supplies (Choke Reset)
A-B Modules

Power Supply

Chassis

Processor

1756 Digital I/O Modules

1756 Removable Terminal Blocks
Injection Kicker Control

Control Rack
- TURN ON
- TURN OFF

High Voltage
- Remote
- TURN ON
- TURN OFF

Check Interlock
- Interlock
- Return

Injection Kicker Interlock System

- Injection Kicker Door #1 Closed
- Injection Kicker Door #2 Closed
- Injection Kicker Air Flow OK
- Injection Kicker Crownbar #1 Closed
- Injection Kicker Crownbar #2 Closed
- Injection Kicker MPS Permit OK
- Injection Kicker Thy #1 Choke OK
- Injection Kicker Thy #2 Choke OK

- Injection Kicker HV Ower Current OK
- Injection Kicker High Voltage Inhibit
- Injection Kicker Thyatron #1 Trigger OK
- Injection Kicker Thyatron #2 Trigger OK
- Injection Kicker Chassis ON

- Reset
- Return
Extraction Kicker Control

Ejection Kicker Control

- **Control Rack**
  - TURN ON
  - TURN OFF
  - Check Interlock

- **High Voltage**
  - Remote
  - TURN ON
  - TURN OFF
  - Return

Extraction Kicker Interlock System

<table>
<thead>
<tr>
<th>Extraction Kicker Door #1 Closed</th>
<th>Extraction Kicker Door #2 Closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraction Kicker Air Flow OK</td>
<td>Extraction Kicker Thyatron #1 Trigger OK</td>
</tr>
<tr>
<td>Extraction Kicker Crowbar #1 Closed</td>
<td>Extraction Kicker Thyatron #2 Trigger OK</td>
</tr>
<tr>
<td>Extraction Kicker Crowbar #2 Closed</td>
<td>Extraction Kicker Chassis ON</td>
</tr>
<tr>
<td>Extraction Kicker MPS Permit OK</td>
<td>Extraction Kicker Thy #1 Choke OK</td>
</tr>
<tr>
<td>Extraction Kicker Thy #2 Choke OK</td>
<td>Reset</td>
</tr>
</tbody>
</table>

Return
Future Upgrade

Two slots left

- Analog set-point and read-back capability
- Ethernet communication