

Quad-Side Nuclear Fuel Inspection System



Versatile, Radiation Hardened, Viewing / Recording System for In-motion Fuel Inspection

The ROS Quad-Side Fuel Inspection System is an imperative time-saver for refueling operations. The modular system is deployed above the fuel upender such that fuel assemblies can be inspected during core offload and reload. The four-sided system employs independently-controlled pan/tilts, zoom cameras, and lights linked to a DVD recording/playback console. The Rad-tolerant PTZ Cameras offer maximum flexibility by allowing real-time monitoring of operation throughout the canal. The IP-addressable control unit can be selectively accessed via your plant's Local Area Network, so that Engineers and Managers can monitor fuel inspection from outside containment.

Utilizes four radiation tolerant zoom cameras on pan/tilts with integral wet-dry lights

Allows simultaneous inspection of all four sides of fuel bundle while moving through the transfer canal and upender

Expedited integrity inspection results in significant critical path time savings

IP-addressable for monitoring via facility's Local Area Network

Users have found the cost/time savings of using the Quad-Side System to be so significant that the system is "paid for" during just the first usage. However the extremely high radiation tolerance of the Enhanced Chalnicon tube RTC-3 Zoom Cameras allows for use of the system through several outages without need for tube replacement.

The Quad-Side System was recently utilized at Comanche Peak in the Fall of 2006 with outstanding results. Outage Managers found that over 4 hours of critical path time was saved solely by the use of the Quad-Side Fuel Inspection System. The managers stated, "the system definitely pays for its self."

The Quad-Side Fuel Inspection System employs rugged time-tested ROS cameras and positioners, trusted by the entire nuclear utility industry for decades.



Quad-Side Inspection System

SYSTEM PERFORMANCE

Composition:	4 x Radiation Tolerant Zoom Cameras on Pan/Tilts with 2 x 75w lights each 1 x Cable-deployed support frame 1 x 38m (125 ft) umbilical cable (longer lengths optional) 1 x Control / Recording / Viewing / Playback Console
Power:	115 VAC / 60 Hz (230 VAC / 50 Hz optional)
Operating Depth Rating:	30m (100 ft)
Operating Temperature:	0°C to +50°C (32° to 122° F)
Storage Temperature:	-20°C to +60°C (-4° to 140° F)
Radiation Tolerance (at camera ports):	7 x 10 ⁷ rad (7x10 ⁵ Gy) max accumulated dose

CAMERAS (RTC-3)

Camera Zoom:	3:1 optical with 2x analog zoom (6x overall)
Sensitivity:	0.62 lux
Horizontal Resolution:	600 TV lines
Image Sensors:	2/3" Enhanced Chalnicon
FOV in Water:	42°H x 33°V (full wide) to 15°H x 11°V (full zoom)
Housing Material:	316 Stainless Steel
Viewing Port:	Dynasil

LIGHTS (WDL-75)

Lamp Type:	Screw-in tungsten halogen
Beam Pattern:	9° conical
Housing Material:	Anodized 6061-T6 Aluminum
Window/Lens:	Dynasil non-browning

PAN AND TILT POSITIONERS (PT-5)

Torque:	4 N-m (3 lb-ft) per axis
Rotation Speed:	4.5°/second
Harmonic Gear Backlash:	0.05°
Scan Range:	360° pan, +/- 90° tilt
Housing Material:	Anodized 6061-T6 Aluminum

FRAME

Structural Material:	6061-T6 Aluminum
Deployment:	Four handcrank-adjusted Stainless Steel cables

CONTROL CONSOLE

Underwater Interface:	Independent control of all cameras, PTs, and lights
Processing:	4-way split screen, or single-feed viewing
Viewing:	Slide-out LCD monitor
Recording:	Hard drive, DVD recorder
Networking:	IP-addressed video server allows real-time monitoring over facility's Local Area Network



Sample frame of nuclear fuel transfer



Sample frame of serial number verification



5618 Copley Drive
San Diego, CA 92111 USA
Tel (858) 565-8500
Fax (858) 565-8808
East Coast Office (804) 754-3936

www.rosys.com
sales@rosys.com