Some alternate technologies for high purity boiler feed water treatment
1. Short Packed bed Ion Exchange

2. Granular Micro Media Filtration
1000 (220 m³/hr) Ultrapure water treatment system at nuclear power station – operating 14 years
TYPICAL INDUSTRIAL WATER TREATMENT SYSTEM

to produce high purity demineralized water

FILTRATION
Removal of undissolved, suspended solids by filtration through particulate media

REVERSE OSMOSIS
Removal of the majority of dissolved materials by reverse osmosis membranes under pressure

ION EXCHANGE POLISHER
Removal of the remainder of dissolved solids using regenerable ion exchange resins

Raw Feed Water

SPECTRUM MICRO MEDIA FILTER

ECO-RO

RECOFLO® DEMINERALIZER

High Purity Demineralized Water
Short Packed Bed Ion Exchange Systems

High purity water….

without mixed resin beds…..

without membranes
Conventional vs RecoFlo®
Recoflo® Features

Short Bed Height
Ion Exchange Resins

Conventional

RecoPur®
Polisher after Reverse Osmosis

- More robust than electrodialysis
- Less pretreatment required (single pass RO)
- No cleaning required
- Auto response to variations in feed
- Will not foul during upset condition
- Very low chemical consumption
- Neutral waste
- Easy on-site maintenance

250 m³/hr RO polisher
2 m X 4 m footprint
2 m high
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<th>Considerations</th>
<th>Short Packed Bed Ion Exchange (Recoflo™)</th>
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| Equipment           | Modular & Skid mounted with 50% less space
Capability of producing high purity water, without the need for a Mixed Bed Polisher |
| Installation        | Performed in days
Resin preloaded, Factory tested, Plug & Play |
| Reliability         | Compensates for Feed Water Quality
Self diagnostics |
| Operating Costs     | Less: Chemicals, Resin, Waste and Labor |
| Environmental       | Produces small volumes of easily manageable wastes |
| Serviceability      | Short cycle times - Facilitates Troubleshooting |
Granular Micro Media Filtration

Membrane quality filtration … without the membranes
Key Design Difference

Conventional Media Filter vs. Spectrum Micro Media Filter™

Media Particle Size:
600-800 microns (20-30 mesh)

Micro Media Particle Size:
100-180 micron (80-150 mesh)
Superior Performance

Particle Size Distribution
Feed: 20 ppm ISO fine dust, 30 ppm SAE 30 Oil

Particle Removal Efficiency
Feed: 20 ppm ISO fine dust, 30 ppm SAE 30 Oil
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