

ENC 2002 Conference Invited Paper

Title :

"Engineering services and operating performance enhancement: one key to plant competitiveness"

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Abstract/key words :

Today, nuclear operators worldwide expect from major vendors a comprehensive set of engineering skills and products in terms of PWR and BWR services to adequately address the critical issue of plant competitiveness.

Typical areas of interest cover cost-effective improvements of plant operating performance and conditions as well as plant life extension.

Some generic examples are categorized below and will be developed in the presentation.

Cost-oriented **plant performance improvement programs** may address :

- power uprate (possibly combined with steam generator replacement)
- systems upgrade (including surveillance systems and operator assistance aids)
- plant operating procedures

Recommended analyses associated to **plant life extension** should cover heavy components (steam generators, vessel, internals...), mechanical systems as well as I/C equipment.

Vessel margins to fast fracture may sometimes need to be reassessed, using advanced neutronic and CFD tools.

SG services are quite diversified (thermal performance, thermal-hydraulic and mechanical analyses, tube integrity assessment, health care services, chemistry optimization...).

As far as fluid systems are concerned, typical services cover detailed material assessment, crack analysis, improvement of operating conditions (to prevent dead leg phenomena or harmful thermal fluctuations for example), as well as periodic test optimization. Identification of potentially critical nozzles and related CFD/fracture analyses may also be of interest.

Also a substantial plus for operators, **Owners Group organizations** allow sharing costs when addressing similar operation concerns.

They also provide a convenient forum to exchange information and to allow easy benchmarking against best practices.

Vendors are also able to provide 24-hour, 7 days-a-week support to plant operators on site through **Emergency Assistance Organizations** in case of any major crisis. Such assistance may be tailored according to specific utility needs and usually proves quite valuable to help protect investments even in case of events of lesser seriousness.

Last but not least, nuclear utilities in many countries face the growing concern of **knowledge management** and skill preservation. Proper scheduling of engineering services in some critical areas may contribute in a cost-effective way to mitigating the long-term issue while, at the same time, providing substantial short-term value to the plant operator.