Wass Consulting Group, Inc.
Management Insight

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Jointly-Owned Nuclear Generating Companies

Formation Issues and Considerations

Summary

This ***Management Insight*** is a follow-up to an earlier edition (Vol. 5, No. 2), which addressed formation issues for JNOCs, and which should be read first. While this current ***Management Insight*** deals exclusively with JNGENCOs, the barriers and constraints to forming JNOCs discussed in the previous issue are also valid for forming JNGENCOs. This follow-up edition points out a number of operating and risk issues, considerations, and analyses that should be addressed before entering into a JNGENCO arrangement, or attempting license transfer. While it is not all-inclusive, it nonetheless attempts to raise the awareness of all parties -- owner-operators and other co-owners -- that careful pre-planning and analysis can help avoid future disputes and financial difficulties among the parties having an interest in these plants. It also points out that, if done properly, a JNGENCO can offer substantial benefits.

Definition of a JNGENCO

In our earlier definition of a JNOC, operating license transfer was not made, nor were production cost/electrical output power sharing arrangements required. These are two major differences between a JNGENCO and a JNOC. We use the term "risk sharing arrangements" to indicate that the owners of the JNGENCO are now fully committed to sharing in capital cost, O&M cost, fuel cost, and power output **irrespective** of which nuclear units are on line.

The new possession licensee is the JNGENCO, and the owners of the JNGENCO are the former possession licensees of each individual unit. Hence, **our definition of a JNGENCO is a single, self-contained legal entity that owns and operates multiple nuclear units. There must be multiple plant sites and multiple JNGENCO owners. All units are managed in a safe, efficient, and reliable manner as an optimized system with regard to cost and operational performance. The nuclear units may differ by age, size, NSSS type, etc., and all JNGENCO owners share in the benefits/risks associated with the combined group of nuclear units in proportion to their ownership in the combined enterprise.**

Attractiveness of a JNGENCO

Three items stand out as the main potential benefits of a JNGENCO, and these may be substantial:

- Lower production costs
- Improved plant performance
- Risk sharing of costs/output (similar in concept to an automobile insurance policy).

Realization of all these potential benefits requires that the best practices, the best of lessons learned, and the best people will be incorporated into the JNGENCO. Realization also requires that the individual units be subjected to careful examination and analyses to ensure that potential cost/reliability

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problems are uncovered up-front, and the impacts of potential negative contingencies are quantified beforehand for each JNGENCO owner.

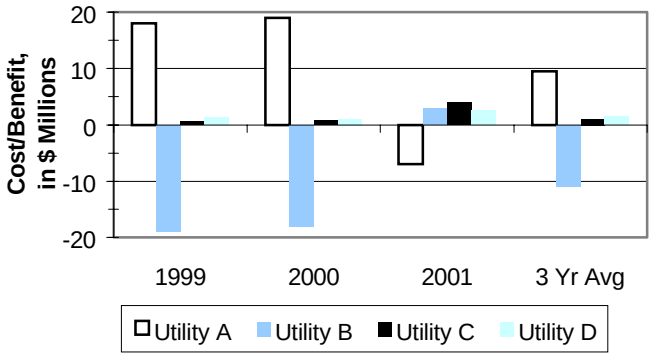
Accomplishing this enables the parties to enter into a JNGENCO agreement knowledgeably, and to compensate for unbalanced factors or subsidies that may be inherent in the way individual units are operated. Some of these factors were discussed in the earlier ***Management Insight***, but some of the factors are more sophisticated and less obvious for a JNGENCO. The next four sections discuss a few of these, including the effects of differing fuel cycles, the impacts of staffing imbalances among the various JNGENCO units, the impact of extended forced outages in one (or more) plant(s), and the risk sharing effect of a JNGENCO organizational model versus a JNOC organization without risk sharing. The dollar figures used in this ***Management Insight*** are illustrative of the actual scale of costs and benefits which might be experienced. For purposes of operating our JNGENCO cost/benefit model, we assumed that four possession licensees would pool seven plants located at several sites, and that no owner had an equity interest in all seven plants. The same cost and operating data were used to develop Figures 1 through 4.

Refueling Cycle Differences

As was discussed in the earlier ***Management Insight*** on Jointly-Owned Nuclear Operating Companies, one of the difficulties/barriers to successful JNOC formation was the "insufficient initial consideration of and compensation for differences in the generating units placed in the pool". As important as it was in the case of JNOC formation, it is even more critical when forming a JNGENCO. Differences in operating philosophy, reliability, efficiency, maintenance practices, age, size, regulatory standing, refueling cycle, and staffing levels (among others) all impact what each JNGENCO member initially contributes to the enterprise. Such contributions are seldom, if ever, equal, and care must be taken to properly estimate each member's input.

Figure 1, for example, shows the impact on four possession licensees of forming a JNGENCO with multiple units with differing fuel cycles (24-month versus 18-month). In this example, our model shows a substantial annual average windfall benefit being reaped by the JNGENCO members which pooled 18-month refueling cycle plants (Utility A, C, and

Figure 1: Effect of Refueling Cycle Differences, by Utility



D), and a corresponding subsidy being paid by the member who pooled 24-month refueling cycle plants (Utility B). Because of the differences in the scheduling of plant refueling outages (and the inherent uneven production cost stream), the analysis needs to be run over a period of years in order to realistically estimate the magnitude of this benefit/subsidy. Note that the output of the model varies substantially based on input variables of plant ownership, timing of scheduled outages, resulting annual capacity factors, and a number of other input assumptions. Results for actual utility possession licensees are likely to be different, given their specific circumstances and operating data.

Staffing Imbalances

Plant staffing is another factor that impacts the value of each JNGENCO member's contribution to the pool. We all recognize that staffing levels directly affect production costs. Hence, possession licensees who pool plants with relative excess staffing actually contribute less value to the pool than those who pool plants with relatively more competitive staffing levels.

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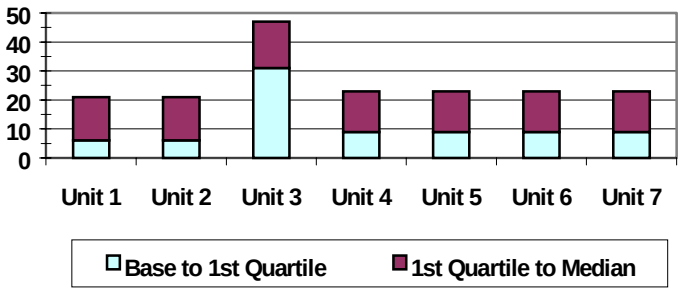
Such differences need to be compared on a normalized basis, and then addressed before JNGENCO formation is complete. Appropriate financial adjustments should then be made among the various JNGENCO members, as required.

The dramatic annual cost impact of higher staffing levels is shown in Figure 2. In this example, an aggressive staffing level goal was set for each unit. In each case, these aggressive base staffing levels fell in the leanest quartile of industry staffing

Figure 2: Added Annual Cost of Higher Staffing Levels



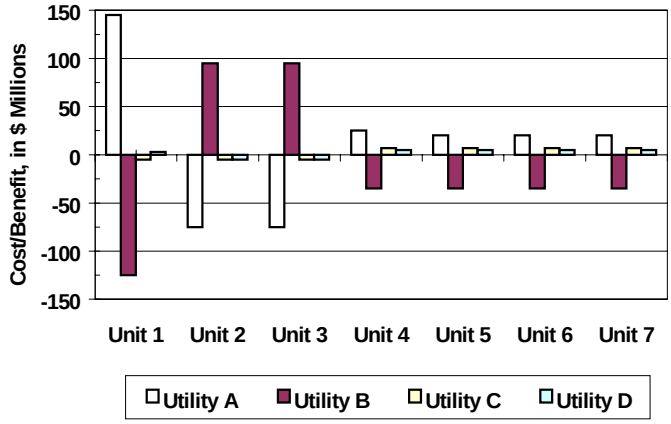
comparisons. The model then calculated the added costs to the JNGENCO enterprise if each plant was allowed to increase staffing first to First Quartile, and then to Median industry staffing levels, respectively. As can be seen in Figure 2, these added costs are substantial and must be explicitly considered during JNGENCO formation. At the start of this analytical process, each unit's actual staffing level (and cost) is compared with its baseline goal. Then, financial adjustments should be made to adjust for imbalances/subsidies.

Extended Forced Outages

In addition to detailed analyses to adjust for differences in what each member contributes to the JNGENCO pool, some quantification of the benefits and risks provided by risk sharing (inherent in a JNGENCO organization) is also required. For example, while the JNGENCO organization will shelter a current possession licensee from much of the risk if one of its former plants suffers an extended forced shutdown, it now faces increased risk from a shutdown of a unit formerly owned by others.

A typical analysis demonstrating the impact of this benefit and/or cost to each JNGENCO owner is shown in Figure 3. Our model calculated the one-time benefit/cost to each JNGENCO member assuming, in turn, that each nuclear unit in the pool were to undergo a one-year unexpected forced outage. As shown in the figure, both the benefits and risks can be substantial, depending on former ownership percentages and which unit is assumed to suffer the forced outage.

Figure 3: Effects of Risk Sharing, by Utility



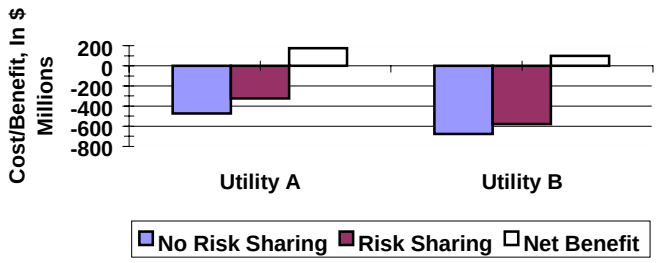
Worst Case Scenario Analysis

Another example of the risk sharing effect of a JNGENCO is shown in Figure 4. Our model calculated the relative impact on the two largest owner/operators of the four possession licensees who were assumed in our example. For each, the worst case was taken to be permanent shutdown of all nuclear plants in which the possession licensee had a legal ownership interest.

Figure 4 below shows that while the negative annual cost impact on either utility is very substantial even with a JNGENCO organizational structure, the risk reduction provided by the risk sharing from the JNGENCO organization is also very substantial. (The model also showed benefits provided to the

other two possession licensees to be comparable, although proportionately smaller.)

Figure 4: Annual Effect of Risk Sharing on Worst Case Scenario



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As with the previous edition on JNOC formation, this ***Management Insight*** can hardly do justice to such an important and complicated topic as JNGENCO formation. Also, as with the earlier edition, we do not see JNGENCO formation obstacles that cannot be overcome with adequate planning and analysis.

The crux of our message is the need to identify, analyze, and deal with imbalances in the resources contributed to the JNGENCO pool **before** the JNGENCO is formed. These imbalances/subsidies will certainly come to light once operating experience is gained, but by then such imbalances might sow the seeds of discontent among the JNGENCO owners. It is much better to identify and deal with these thorny issues ahead of time.

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The Wass Consulting Group

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Our services address the challenges that senior executives and Board members face in their regulated and non-regulated operations. This includes matters of mission, governance, strategy implementation, organization structure, business process transformation and re-engineering, operational improvement, benchmarking, competitive analysis, post-merger integration, and market entry. We combine a base of exceptionally experienced partners with an extensive and expert network of professional consultants and affiliated firms.

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