Patrick Holcomb, Executive Vice President, Process, Power & Marine, Intergraph Corporation

Tremendous process capacity is coming online in the next five years in the oil, gas and petrochemical segments. Capital spending on these facilities has been ramping up from $100 billion a year in 2003 to well over $200 billion per year in 2008.

Owners are expanding existing facilities and building new capacity at record levels to meet growing demands in the increasingly competitive global market. This must be done with finite material and labor resources and tight capital expenditure (CAPEX) budgets. Expansions and new construction also must be done quickly to meet exacting schedules that are established to minimize time-to-market and maximize time-inmarket ROI. After startup, owners are constantly challenged to achieve safe, sustainable production at the lowest possible operating costs (OPEX)— *despite higher-than-ever product demand and competitive pressures.*

One challenge that has historically plagued the process industry is the conflict in incentive systems and procedures between the CAPEX and OPEX segments of the business. There has been no major innovation in CAPEX strategies to reduce subsequent OPEX since standardization on automated digital control systems (DCS) and general acceptance to specify integrated heat recovery systems.

In general, CAPEX personnel are still strongly incented to achieve safe, on-budget and on-time startup with relatively little post-startup interest. However, the good news is that there have been some evolutionary improvements in CAPEX strategy and new technologies to enhance operations and maintenance efficiency.

More and more owner operators (O/Os) are involving operations and maintenance personnel earlier in the capital process than a decade ago. With 3D modeling a standard requirement on large projects and advanced enterprise engineering software available as a repository for plant data from its inception, many O/Os take the opportunity to conduct more thorough operability and maintainability reviews with their operations and maintenance teams and the CAPEX/engineer's staff. This allows maintenance and operations staff to catch more critical issues sooner in the process, leading to time and money savings over the life of the plant.

Many O/Os are becoming more involved in the planning for project information handover. In the past, handover was the delivery of a pickup truck full of paper drawings. Now, O/Os are increasingly dictating very specific electronic handover steps—*to use as project milestones and to ensure more richly populated maintenance systems*
. New enterprise engineering data management solutions coupled with portal technologies and service-oriented architecture (SOA) further enable better access to technical information post-startup without the burden of actually using the underlying authoring application. This means that O/Os can be more aggressive about their plans for managing their engineering design basis and simultaneously realizing better solutions for operations and maintenance.

Another significant evolutionary trend is that reliability-centered maintenance is starting to be considered in the capital project phase. While this is by no means standardized, more capital projects than ever before are demanding more maintenance and reliability plans as part of the project.

In conclusion, though the capital phase still is run largely on objectives of ensuring a safe, on-budget, on-time startup at stated capacity, there are increasing considerations made for long-term capacity assurance and OPEX after the project startup crews are gone. By factoring in OPEX during plant conceptualization and managing enterprise engineering design basis, O/Os can realize improved and sustained savings over the full life cycle of their plant investment. **MT**

This article is part of Maintenance Technology's 2008 Industry Outlook, the annual executive roundtable. Columns from each of the 14 thought leaders who participated can be found at the following link: http://www.mt-online.com/article/0808-industry-outlook

Maintenance Technology **is sent free to qualified subscribers each month. Visit www.subscribeMT.com**
to fill out an online application for your free one-year subscription today. By doing so, you will join more than 50,000 technical and business professionals who already receive Maintenance Technology magazine, your source for capacity assurance solutions.