

## Charon-AXP saves nuclear power plant systems



### The Challenge

In a nuclear power plant, DEC Alpha computers play a major role in the key monitoring system, Power Plant Control Robust System (PPCRS). As the eyes of the nuclear power plant, PPCRS collects data from all subsystems (nuclear reactors, gas turbines, cooling systems, power transmission systems) and displays the information in a graphical format for system administration. The entire power plant operation is managed accordingly.

While PPCRS had been running for more than 20 years, the digital hardware platform was still a good functional fit for the operation. As with any technology, the age and reliability of the platform was a cause for concern for this mission critical system. The aging system was experiencing unexpected system failures potentially causing catastrophic repercussions. Over time, spare parts became increasingly unreliable due to the shortage of the supply and the quality of the spare parts.

In order to modernize their hardware platform, TaiPower management evaluated two options:

1. Incur heavy costs to re-write the PPCRS application and move to a new operation system,
2. Or, using Stromasys Charon AXP emulation software to virtualize the platform on new cutting-edge hardware.

Developing the new PPCRS application was a significant expenditure of more than NT \$100 million, and it would have taken over 2 years in coding and implementation time. Furthermore, the training of the operators and updating the SOP on a new application would have created further cost and time due to the importance and complication of the new platform training for the nuclear energy operators.

### The Solution

After careful evaluation, management decided to go with Charon-AXP emulator. The decision was obvious since the investment of Charon was only 5% of re-planning the system, and Charon's proven ability to emulate the legacy AXP system onto a stable and modernized hardware platform. In addition, since PPCRS was perfectly replicated, no additional training was required for the operators.



#### CUSTOMER PROFILE

The Taiwan Power Company (TaiPower) is a state-owned electric power company providing electricity to Taiwan and off-shore islands of the Republic of China. Their services cover power generation, transmission, distribution and supply. TaiPower has been operating in Taiwan for more than 60 years and has over 40 power plants, including hydropower, firepower, nuclear and renewable energy (wind, solar, geothermal).





Migration of the PPCRS system took place within 24 hours, from the Real Alpha platform simulated to Charon-AXP's virtual system. In nuclear power plants one and three, TaiPower had totally deployed 10 instances of Charon-AXP to replace the original Real Alpha computer. The new generation of Intel Xeon servers has outperformed the legacy Real Alpha System, and the Charon AXP plus the new generation HP servers offer an even higher performance level and a more stable environment for PPCRS.

Topman technology, the system integrator, also assisted TaiPower to upgrade their backup system to automate online backups, making the system able to be restored within 3 minutes versus hours on the legacy platform. Power plant system engineers can now easily maintain their system avoiding additional security and service costs, in addition to avoiding any emergency conditions and unexpected hardware errors. It also created an operational efficiency, as their current IT staff was well versed on the familiar hardware, so annual maintenance cost was also significantly reduced.

## About Stromasys

Stromasys is the original and leading provider of enterprise-class cross-platform virtualization solutions, including PDP-11, Digital VAX and Alpha, PA-RISC, and SPARC servers. The company extends the life cycle of business and mission-critical systems through virtualization, modernization, and system enhancement.

Founded in 1998 and headquartered in Geneva, Switzerland, and in Boston, Massachusetts, with sales offices as well as engineering, development, and research labs located around the world, Stromasys has implemented cross-platform virtualization solutions for the world's leading companies in over 70 countries.