MANUFACTURING

Project Profile

Philips Semiconductors Ensures Security, Safety, and Productivity with *Continuum™*

Philips Semiconductors
Albuquerque, New Mexico

"The system works exactly as planned. First and foremost, it helps us provide a very safe and secure work environment. Additionally our security folks love it because it's so much easier to use. Our emergency response team is very happy with it because it gives them real-time information. It makes their job a lot easier."

-Bob Sanders
Philip's Security Manager

In eight of every ten mobile telephones, in four of every ten color televisions, and in countless computer peripherals and cars, lives a Philips Semiconductors integrated circuit. Most people rarely think of the design technology required for these chips, much less the safety challenges of their manufacture. At the Philips Semiconductors plant in Albuquerque, New Mexico, Andover Controls Representative, *Entech Sales and Service, Inc.,* addresses exceptional security and safety needs through systems integration.

The Philips Semiconductors Albuquerque facility is approximately 500,000 square-feet (46,450 m^2), comprised of four clean room manufacturing areas (FABs) and adjoining materials storage and office spaces. They currently produce semiconductors used by Philips Semiconductors' clients all over the world.

There are a variety of manufacturing processes taking place at the plant, but all have common steps. Philips Semiconductors purchases raw silicon wafers and applies from 28-52 process layers, each made up of thousands of resistors and transistors. Initially, an epitaxial coating is laid down. Next, the integrated circuit process adds numerous layers through etching, photolithography, diffusion, baking, and other techniques. The completed wafers containing hundreds of "die" are then sent to another facility to be cut and assembled into an integrated circuit package. While this manufacturing process demands a very high level of attention and control, ensuring a safe and secure workplace is the most important priority for Philips.

No Room for Error

Philips Semiconductors' goal is to maintain non-stop production capability in a very safe and secure work environment, says Bob Sanders, Security Manager at the plant. "Our worker safety is taken very seriously. We have fire, security, card access, and toxic gas monitoring systems."

Andover Controls

A Balfour Beatty Company

Industry-wide, the semiconductor manufacturing process uses a number of toxic gases and chemicals — gases such as diborane, arsine, phosphine, and silane are a standard part of the creation of semiconductors. They are stored in special compressed gas cylinder cabinets throughout the manufacturing areas and piped to equipment in the FABs. Besides the highly toxic nature of the gases, some are also pyrophoric and could cause an explosion. Semiconductor manufacturing environments, thus, demand extensive and reliable monitoring systems.

Andover Meets the Systems Challenge

Philips Semiconductors has always had extensive safety and security monitoring systems. However, there were complications due to disparate systems. "We had a multitude of different monitoring systems," says Sanders. "We had various pieces of equipment that reported back to the security control center where we have one security officer who was responsible for monitoring all these points on multiple pieces of equipment and screens."

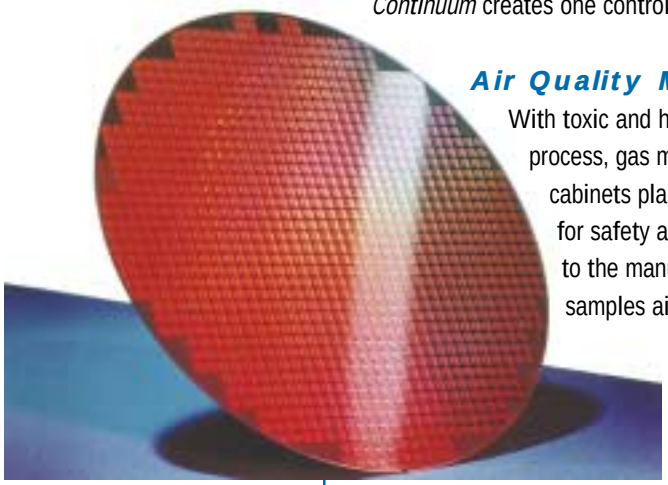
CyberStation's Dynamic Graphic Display

Besides the complexity issue, there was a functionality problem. When an event occurred that activated a warning system, the security staff would manually gather information to initiate a response. "But what we had to do was not only manually look up procedures and instructions, but then send somebody down to the alarm unit to get the value and relate it to that alarm," stresses Sanders. "We knew what type of event, as in the case of a toxic gas alarm, but somebody from the response team would have to stay by the monitoring equipment and relay the readings to the ERT Team.

"In 1996 I began looking for something to make our responses more efficient," says Sanders. "I wanted a unit that would integrate these different systems into *one* head-end."

Entech Sales and Service, Inc., the local Andover Representative, designed and installed an *Infinity* building controls network that would dramatically affect operations at the Albuquerque plant. The solution not only eliminated the complications of the old system, but also delivered exceptional new operational capabilities. Since then, *Entech* has continued to assist Philips Semiconductors with an upgrade to the *Continuum*™ product as part of the facilitation of two new FAB modules, and also with their special needs for programming and expanding monitoring capabilities.

Now, the security control center has one interface — *Continuum* CyberStation™ — resulting in improved safety and efficiency. It controls and monitors every critical system: toxic gas monitoring, fire alarm system monitoring, and security. From open doors to air quality monitoring, from the lobby to the parking lot, *Continuum* creates one controls universe in one interface that monitors over 2,000 alarm points.



Air Quality Monitoring

With toxic and hazardous production materials used in the semiconductor manufacturing process, gas monitoring is a very critical system in the building. There are numerous gas cabinets placed in the Sub FABs and gas bunkers located away from the production area for safety and maintenance. From here compressed gases and chemicals are dispensed to the manufacturing process equipment. The MDA gas monitoring system not only samples air quality, but also the process equipment in the FABs. Moreover, it is also able to detect a chemical leak or spill.

Should there be a toxic gas alarm, *Continuum* CyberStation would provide an onscreen alarm, instantly display the incident location on a building layout, and deliver response instructions. The control center security officer would then send another officer to investigate and notify that FAB's emergency response team (ERT) via pager.

"The nice thing about the Andover system and the interface we've created with MDA, is that we get real-time analog values," says Sanders. "We actually see the level of gas and the readings. After a response has been sent out and the problem is being investigated, we can actually see the real-time results of our response efforts." In addition, security and safety personnel can shut down any point in the gas system, from the cabinets to the machines.

In the case that an event might affect an entire FAB, *Continuum* would automatically sound multiple audible evacuation alarms, shut down affected gas sources, and send out a page to the ERT and security team. Upon arriving to the suspected leak or spill area, the ERT would use one of four *Continuum* Limelight™ workstations to view the exact alarm event and the OSHA MSDS sheets for detected gases or chemicals. Based on the materials identified by the MDA system, the *Continuum* system can actually provide the correct MSDS sheets.

Limelight Workstation

Continuum Limelight is an Andover Controls "Thin Client" user interface that allows you to control and monitor your building right from a standard PC. "As a result of this system, Philips Semiconductors is able to help ensure the safety and security of the work environment," says Sanders.

Security and Fire Systems

Safety and security have always been high priorities at the Philips Semiconductors Albuquerque plant. Card access controls entry to more than 62 doors, including the main lobby, the visitor lobby, special areas, and the parking lot. Four *Continuum* CyberStations, two *Episuite*™ photo badging stations, and HID proximity readers deliver security and access for more than 1,500 employees and contractors, as well as a comprehensive interface for officers.

Continuum CyberStation enables the security officer to view critical access points from multiple cameras. Digital video recording is accomplished through Intellex 16-channel recording units, currently being integrated with the Andover system. As an individual uses an access card, all information from the card is displayed along with live video from the access point and the photo on the card.

"With Andover, we'll be able to have remote video monitoring, which will allow us to monitor and review video from any of our properly configured workstations in the facility, not just at the control center," notes Sanders. "Instead of interrupting security officers who might be in the middle of a situation, I can go to another workstation and bring up the video."

The Edwards fire alarm system, with hundreds of points, is also integrated with *Continuum*. Before the Andover system, Sanders and his team used a complex collection of equipment to monitor these alarms. "The Andover system allows us to not only monitor those alarms, but initiate a response by clicking a button on the screen," he says. "We can evacuate one or more areas, a floor, or the entire facility." *Continuum* provides complete control and backup monitoring of all the security and fire-life safety systems from not only the security control center, but from any properly configured PC or Limelight workstation on the secure network.

Bob Sanders,
Philip's Security Manager,
at the *Continuum*™ CyberStation™

The Benefits of Andover Integration

The Andover system has been extremely reliable, and Sanders and his team are quite pleased. "*Entech* has done a great job. The Andover system is a tremendous upgrade to maintain a safe and secure workplace. The programming and the software are the secret to our system. *Entech* has come up with some very innovative programs and was able to use the protocols supplied by MDA and integrate them into Andover. We've also had a lot of positive comments from the ERT from the information on the Limelight workstations."

Now that safety and security situations are managed more efficiently and accurately, "there's a tremendous cost savings," says Sanders. "We're taking actions based on real events and eliminating many opportunities for false alarms. The system is so much more robust and dependable than our old systems. At a considerable cost for each hour an FAB is down for an evacuation, the ROI is quite rapid."

With Andover Controls equipment and the excellent service from *Entech*, Philips Semiconductors can be assured of a safe and stable environment and concentrate on what it does best — supplying good semiconductor chips to its customers.


Security Control Center


Continuum NetControllers


MDA Gas Monitoring System

PROJECT AT A GLANCE:

Project Type:
Security/Safety

Project Name:
Philips Semiconductors

Location:
Albuquerque, New Mexico

Market Segment:
Manufacturing

Number of Buildings:
1

Total Square Feet:
500,000 (46,450m^2)

Andover Controls Equipment Installed:
1 – *Continuum NetController*
32 – *Infinity* / *Eclipse* CX 9410 Network Controllers
4 – *Continuum* CyberStation NT Workstations
4 – *Continuum* Limelight Workstations
4 – *Infinity* ACX 700 Access Controllers
8 – *Infinity* ACX 780 Access Controllers
24 – *Infinity* IDX 800i Intrusion Detection Controllers

Network:
Fiber Optic LAN (Ethernet TCP/IP)

System Runs on Existing Network:
Yes

Applications:
Access Control
Alarm Monitoring
Toxic Gas Monitoring
CCTV Digital Recording
Fire Alarm Monitoring
Photo ID Badge with Time & Attendance Compatibility
Automatic Pager Notification

Third-party equipment and/or drivers:
Zellweger Analytic -
MDA Scientific Toxic Gas Monitoring System
Intellex Digital Recorders
Multiple Cameras
EST Fire Alarm system
Communications [Radio and Alphanumeric Paging]

Number of Controlled Doors: 62

Number of Cardholders: 1,500

Total System Points: 5,200

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