



**Case Study III**

**Varian Series 3000 Sputter**

(150mm fab)

**Process and Machine Problems**

Listed below are the results of five of the most common machine-crash situations:

1. Hot-leak caused 14 days downtime and very high service-specialist cost
2. An RF-etch failure caused total damage to 400 wafers
3. HV spikes ('glitches') caused partial damage to 700 wafers
4. Heater temperature-control failure caused damage to hundreds of wafers
5. Operator that selected the wrong process caused the scrap of 500 wafers

As an example, only the damage caused by RF-etch failure was computed:

Cost of scrapped wafers -	400 wafers @ \$300/wafer	\$120,000
Machine downtime to find the cause and fix -	15 hours @ \$500/hour	\$7,500
Process and maintenance work -	30 hours @ \$100/hour	\$3,000
Cost of test wafers -	25 wafers @ \$20/wafer	\$500
Delayed product, re-catch production, est. -	400 wafers @ \$50/wafer	\$20,000
Other equipment idling, 1% low overall fab utilization	336 hours @ \$100/hour	\$33,600
<b>Total one-event loss:</b>		<b>\$184,600</b>

**The TadiVac Solutions**

After the catastrophic occurrence, a TadiVac2000 was immediately installed. The RF bias, as well as the forward and reflected power, are now monitored continuously, avoiding the process when the RF-etch is absent.

In addition, the TadiVac2000 locks the machine in order to avoid wrong processes. It monitors and keeps the wafer temperature within boundaries, fully tracks the vacuum and its rate-of-change, and inhibits all the above mentioned potential crash situations. All these benefits for the cost of less than ten percent of the loss caused by one event!

**Ultimate Results**

- "Crashes" are now minimized.
- Less engineering work, test wafers, tests, and maintenance adjustments are needed.

**Over-All Fab Yield, Capacity And Profitability Were Increased !**