



MEMO

TO: **Sanford Health:** Mr. Jim Denevan- VP Facilities for Sanford Enterprise, Mike Erickson- Executive Director Facilities & Support Services, Don Marty- VP Facilities Services, Jim Durben- Director of Building Services

FROM: **Mike Davis- President, Innovative Control Systems, Inc.**
(w/ support from Jim Durben, Director of Building Services and his staff)

RE: **Summary of Transient Voltage Surge Suppression applications and results for Sanford Health Systems facilities, Fargo, ND effectively dated January 1998 through the present (15 plus years).**

INTRODUCTION The intent of this memo is to summarize in an organized and complete manner the historical time line, applications, investment, return on investment (ROI), and conclusions relative to transient voltage surge suppression (TVSS) currently purchased and installed at Sanford facilities. The justification and reasons for using high performance filtering TVSS technology supplied by Innovative Control Systems, (ICS) are to extend equipment life; reduce electrical maintenance and repair; increase equipment performance and reliability; dramatically reduce downtime; and reduce risk of catastrophic loss to all protected electrical and electronic equipment.

HISTORY Our initial meeting with what is now Sanford Health was at the South Campus (Dakota Heartland) in early 1997. The initial group that was presented information consisted of Darrell Cariveau, George Heck, myself and others associated with facilities and operations. Initial small purchases were made starting in December 1997 and virtually every year since then through 2012. A majority of the TVSS technology was purchased after July 2004.

Most of the applications began with obvious problems with repairs and maintenance to control systems on HVAC systems and then scanning equipment (see Jim Durben memo dated 4-28-07). The costs associated with maintenance repairs and downtime were virtually eliminated

establishing a track record of 100% success with a payback on the investment cost of months at most.

In the year 2000 a complete facility survey of the Meritcare South Campus Hospital Facility was done with a total cost estimated of about \$200,000.00 at that time. The Dakota Heartland Health System was having financial problems therefore everything was on hold ultimately leading to the acquisition by Meritcare.

Starting in 2002 Meritcare purchased and installed various Total Protection Solutions TVSS equipment for protecting various control systems on “new” installations for the most part (i.e., ATS, chiller controls, air handling, temperature controls, etc.) at Sanford North Campus and Southpoint. A significant installation was on an electronic lighting panel at Sanford Southpoint (#H21) installed June 28, 2005. This installation was done to monitor the maintenance/replacement/and repair costs with filtered TVSS protection and compare it to the historical per year costs without TVSS(the average of the most recent 3 years). The ROI on this lighting test has clearly trending to approximately 6 months (see George Heck memo and TPS ROI calculator). The investment cost of the TVSS unit was \$1,700.00 installed; while the average yearly typical maintenance equipment repair cost was reported as \$3,346.00/yr. Mr. George Heck carefully researched the historical lighting cost and has kept track of the costs after the TVSS device was installed.

In 2007 we had \$23,000 plus damage to the roof top chiller located above the power plant at the Sanford North Campus. This cost does not include any costs associated with safety or operational issues as a result of the downtime. We installed a Total Protection Solutions (TPS) TVSS devices to protect the chiller and chiller controls at a cost of about \$2,000. In the summer of 2008 lightning hit the chiller roof top area. The TPS TVSS device sacrificed itself as a result but there was no damage to the chiller or chiller controls. The TPS TVSS device was immediately replaced under the 30 year unconditional free replacement warranty at no cost to Sanford. In 2010 we had another lightning strike hit this same roof top chiller area. We immediately called Larry Quamme, the TPS TVSS local representative, and he arrived on site. After our investigation we found no damage again to the chiller and chiller controls. The TPS TVSS device was again replaced under warranty at no cost to Sanford.

The installation of the TPS TVSS protection to the equipment clearly indicates significant cost savings in all equipment operational cost areas (i.e., maintenance/repair, downtime, safety, performance & reliability, and risk of catastrophic loss). The combination of utilizing high performance power system protection technology and having access to experienced local support is a valuable asset in achieving long term improvements to the sustainable savings goals on a permanent basis.

TVSS APPLICATIONS/INVESTMENT The various TVSS applications have been over a fifteen (15) year plus period and at 3 or more Sanford facilities. There have been a wide variety of applications including but not limited to HVAC controls, CAT scans, Cath Lab, MRI, X-ray, motor controls, Johnson Control’s building automation system, air handling controls, computer imaging controls, new panel installations, a lighting panel under test, and roof top chiller/chiller controls.

In the beginning most of the installations were chosen because there were maintenance and downtime issues. From all internal reporting every installation was 100% successful virtually eliminated the existing cost of repairs and downtime exceeding most expectations. This evaluation did not include the most important issues of improved security, safety, and quality patient care.

The TVSS application (June 2005) at the Sanford Southpoint facility on a lighting panel previously referenced is most interesting because it was being monitored to evaluate the possible savings relative to typical lighting system maintenance. The savings at this time is 90% plus with an estimated ROI of 6 months. This is extremely important relative to evaluating a total facility TVSS protection system because lighting is not considered a critical load in any facility. This kind of dramatic improvement and savings clearly implies the tremendous savings relative to all the facility equipment. The logical implications to dramatic improvements to reliability, downtime, capital equipment life, life safety issues minimizes any risk associated with a total system approach for all Sanford facilities.

RETURN ON INVESTMENT (ROI) Return on investment consists of two components, Payback and Life Cycle Savings.

Payback is simply the time it takes to get the original investment back. Based on Sanford's investment up to this point it appears on all retrofit installations where costs of downtime and repair/maintenance were known the costs have virtually been eliminated to date. Based on this we might conservatively estimate the payback to be less than 6 months. Other installations were on new equipment, breaker panels feeding equipment, or equipment controls for "other" equipment that had previously mentioned downtime and/or maintenance.

The second component to ROI, Life Cycle Savings, is really the key to how good any particular investment is. Life Cycle Savings is the cumulative savings over the useful life of the investment. Total Protection Solutions TVSS has a 30 year unlimited free replacement warranty including lightning on the TVSS power panel devices. This is extremely important to Sanford because after the initial payback there is basically an infinite savings potential. Compare this to energy savings projects that are normally justified on a 10-15 year payback because it is considered a "forever" life cycle.

It is apparent from over 15 years of application experience in Sanford facilities we can conservatively expect a 6 month to 1 ½ year payback on this investment.

CONCLUSION It appears effects from high frequency transients and surges on all electronic and electrical equipment within Sanford facilities is a majority reason for inflated operational and capital costs across the board. As the TVSS applications results at Sanford suggest, if all the Sanford facilities had installed a Total Protection System in January 1998 (the first TVSS application installation) Sanford Health System would have saved anywhere from 10 to 30 times the initial investment based on a 6 month to 1 ½ year payback at a minimum. The savings suggested would be just the tip of the iceberg when you realize the infinite Life Cycle

Savings because of the 30 Year Unlimited Free Replacement Warranty and over simplified cost analysis.

The TVSS applications ROI at Sanford is based only on maintenance/repair and maybe some downtime numbers. Other significant factors relative to ROI that would only add to the justification and savings include factors previously noted such as increased equipment performance & reliability, improved diagnostics, improved life/safety, extended capital equipment life, increased productivity/revenue, reduced catastrophic loss risk and costs relative to inflation.

There is a tendency in all companies to have a higher priority relative to minimizing first costs of operations and investment in new equipment and expansions that increase revenue. With today's technology dependant world it is necessary to work hard at changing some long existing paradigms and costly priorities. Every dollar saved now and in the future within a facility has the same value as any profit dollar generated from new revenue. It could have even more value because the investment to generate the savings is a onetime expense with permanent ever increasing life cycle savings.

MOVING FORWARD It is suggested we consider and review all existing TVSS surveys/proposals of Sanford facilities for immediate capital funding or short term financing alternatives (i.e., 2 or 3 year lease terms via facility operations vs. capital budget dollars); a program for expediting and collecting TVSS survey/proposal information on a priority basis for all Sanford facilities (i.e., Sanford North Campus, Southpoint, Sanford Clinics, "other" Sanford facilities).

While organizing and surveying the existing Sanford facilities, pursue acceptance with justification for a financing plan for the various facilities.

The justification for considering a plan as described above is the very short term payback with extremely long term Life Cycle Savings.