OVERVIEW OF CONSULTING AND AUDITING PROJECTS

AEROSPACE & AUTOMOTIVE

- Aircraft Propellers - The buildup of static electricity on propeller blades was a concern. SOLUTION: Materials were tested at ETS and the customer's facility. Industry specifications were reviewed and a report with recommendations was generated.

- Updating Electrostatic Test Methods - Out of date specification and procedures were being used. SOLUTION: ETS was issued a contract to review existing specifications and develop new methods to improve measurement reliability.

- Communications Equipment Failures - Communications equipment was failing due to low-level ESD events. SOLUTION: A site survey was performed to locate the source of the problem and recommendations were made by ETS to eliminate the problem.

- Pretentioners - Airbag and seatbelt pretentioners are designed to be immune from ESD events. Under certain circumstances, the complete system could be susceptible to ESD events. SOLUTION: ETS conducted ESD susceptibility testing of devices and systems and also performed multiple facility audits. ETS recommended procedures to be implemented to ensure safe handling.

AUDITS & TRAINING

- ESD Awareness - A company wanted to evaluate their in-house ESD program. SOLUTION: ETS was retained to perform a facility audit on the current level of static awareness. A report was prepared based on the findings and recommendations were made on static control procedures to ensure safe handling of the product to increase productivity.

- ESD Program Evaluation - A company wanted to evaluate their current ESD program where hazardous monitoring equipment was assembled and tested. SOLUTION: ETS was hired to perform an ESD Audit and predict the risk of ESD damage to product during manufacture.

- Multiple Facility Audits - A manufacturer of telecommunication amplifiers had concerns about the static control program currently in place. SOLUTION: To address these concerns ETS was retained to perform an electrostatic survey of multiple facilities to verify the effectiveness of current procedures and to recommend improvements.

- Acquiring of a New Division - A company purchased a new division with the intent of expanding into the renewable ESD products industry, however, they possessed little expertise in electrostatics. SOLUTION: ETS was retained to present a training seminar which was filmed and shown to additional employees.
FILMS

- Photographic Film - Static discharges were causing streaks on film. SOLUTION: After performing a survey and evaluating the process, ETS recommended modifications to the film developing machine to eliminate static related problems.

- Product Damage - An extruded product running at very high speeds was breaking when the machine speed reached a certain level resulting in a loss of time and money. Triboelectric charge generation was suspected. SOLUTION: ETS conducted a facility audit and performed measurements during operation and determined that static was being generated and could be quantified. A report was generated and equipment was recommended and purchased to eliminate the problem.

FLAMMABILITY & EXPLOSIVE

- Flammability Concerns - The coating supply would periodically run dry causing the base film to generate sufficient static charge levels to ignite solvents. SOLUTION: ETS designed a monitoring system to warn and then shut down the process when minimum static levels were exceeded.

- Fire Evaluation - A flash fire caused an extrusion and coating line to be shut down indefinitely pending the determination of the source of the fire. An ESD event was suspected. SOLUTION: An ETS Consultant was rushed to the facility to interview staff on the actions leading up to the fire and then to monitor the process which was run under controlled conditions. Observations and drawings were supplied. Recommendations were offered on how to eliminate potential problems and equipment was supplied.

- Transportation of Explosive (Commercial Application) - A company wanted to migrate from metal containers to a plastic bucket (or plastic-lined container) to better control suspected moisture problems associated with the metal containers. Thresholds were needed to predict the risk of ESD damage to product during manufacture. SOLUTION: ETS initially performed testing of the various components to establish ignition energy levels and then generated a report with findings and recommendations. ETS subsequently perform an ESD Audit of the facility after implementation of the recommendations and offered additional suggestions.

- Hazard Containment and Neutralization – ETS was retained to evaluate the level of static charge build-up when the absorbent material is disbursed to determine the energy that is generated and if it is at levels that will support ignition. SOLUTION: ETS developed a custom, outdoor test procedure and monitored the high-pressure disbursement. The system was found to be safe and a report with supporting data was issued.

FLOORING

- CleanRoom Evaluation - A new Cleanroom Facility was being built at a US university and the installed flooring and walls needed to be evaluated to assure they meet the requirements of the university and the specifications of the supplier. SOLUTION: ETS was contracted to perform testing of the surfaces in accordance with industry specifications. A report with data sheets was generated and recommendations were made. Additional testing may be performed on ionization equipment when installed at a future date.
• ESD Flooring Evaluation – ETS was retained to determine the electrical resistance of the existing static dissipative floors, determine the electrical resistance of replacement dissipative tiles and determine if cracking in the tiles affect their electrical performance. SOLUTION: An ESD Audit was performed and a report generated covering the finding and offering recommendations.

• Antistatic Treated Carpet Evaluation – After installation of new carpet, complaints from personnel receiving static shocks when touching metallic areas at ground potential were being received. To minimize this problem, the carpet manufacturer suggested using a topical antistatic agent to control charging to levels below the manufacturer’s specifications however, complaints of ESDs still persisted. SOLUTION: ETS was retained to perform static measurements of personnel walking on the carpets located in the targeted areas. A report with recommendation was generated.

LAWSUITS

• Lawsuit - A lawsuit was filed on patent infringement. ACTION: ETS was retained to perform ESD Material Testing and support for staff on ESD issues and terminology. ETS then provided testimony in court as an expert witness on ESD issues.

• Lawsuit - Static discharge was suspected in a personal injury suit. ACTION: ETS was retained to evaluate the electrostatic characteristics of products and provide a formal report.

MANUFACTURING

• Electronic Devices - A new generation of electronic devices were found to be susceptible to ESD voltage levels of less than 30 volts and units were randomly failing. SOLUTION: A site survey was performed which determined the installed ionization equipment was actually charging the parts and personnel. ETS recommended corrective actions to maintain a static free work area.

• Product Failure & Yield Issues - Lack of awareness of the effects of static electricity were contributing to product failure and low yields due to particulate contamination, misuse of ionization equipment and lack of awareness. SOLUTION: An ESD training session was devised to educate staff and a facility audit was performed to locate problem areas. Recommendations were made to implement static-safe procedures and train staff. ESD equipment recommendations were also made.

• Product Cleaning Process - The particulate flow rate of multiple blasting nozzles was being reduced due to clogging. This in turn was causing defective products to be produced. SOLUTION: Electrostatic charge levels were used to monitor the particulate flow. When a line clogged, an alarm signal generated a warning and stopped the process. Equipment was designed and installed by ETS and training was provided.

• Automated Stacking of Cardboard Product - A stacking operation for cardboard containers used for liquid (juice, milk, etc.) was experiencing static related problems. High levels of static charge were being generated during handling and stacking. SOLUTION: ETS conducted a facility audit and process analysis to determine where the static was being generated and recommended systems which could be used to reduce static build-up.
MEDICAL & PHARMACEUTICAL

- Packaging of Medicine - Static electricity was causing production problems during the automatic insertion of pills into the plastic package. SOLUTION: The process was evaluated during a site survey. Recommendations were made and training of personnel was performed to minimize the problem.

- Cart Equipment Failures - The failure (in a hospital) of patient care electronic equipment. SOLUTION: A site survey was performed and recommendations were made to the hospital and equipment manufacturer.

- Hospital Employee Discomfort - Hospital personnel were receiving serious ESD shocks while walking on particular floors in a new section of a hospital. These events usually occurred after pushing a cart and touching a metal door handle or touch-plate. Personnel reported receiving discharges that were considerably more painful when pushing linen carts with blue nylon covers and infant warmer carts. SOLUTION: ETS was retained to perform electrostatic measurements on personnel walking and pushing carts in the targeted area. A report with recommendations was provided. A follow up audit was later performed to evaluate the implemented changes and compare the results to earlier measurements.

MISC.

- Field Data Router Failure – A router was experiencing failures in the field presumably due to ESD. The company wanted to evaluate the current product and offer modifications to fix the existing problem. They also wanted to improve the design of the router in production. SOLUTION: ETS was hired to perform ESD susceptibility testing of the router and to evaluate the production process. A report with recommendations was provided.

- Telecommunications – Systems were failing during customer use due to electrostatic discharges. SOLUTION: ETS was contracted to investigate the problem and found that the charges on both the personnel and seating were causing the events. Suggestions were made to minimize the problem.

- Nonwovens Material - Static charges were affecting the performance of high-speed machinery causing jams to occur. SOLUTION: ETS performed a site survey and recommended the correct static control procedures, installation of equipment to monitor and eliminate problems and training of personnel.

- Oil Industry - Establishing safe ESD levels for wipe materials used to clean oil and other spills. SOLUTION: Materials were evaluated and a specification was written by ETS for the industry to use as a guideline.

- FIBC’S (Flexible Intermediate Bulk Containers) - No industry guidelines were in place for the proper testing of FIBC's. SOLUTION: Materials were evaluated by ETS and guidelines were recommended.

- Canned Cooking Fuel - Evaluate plastic shipping containers and fuel for the effects of ESD and determined the ignition energy level. SOLUTION: Packaging and material was evaluated and ignition energy thresholds were established.
- Vending Machines - A new generation of vending machine was experiencing problems dispensing products due to the effects of static electricity. SOLUTION: The machinery was evaluated using ESD simulation and measuring equipment and corrective actions were implemented.

- Appearance of Ceiling Tiles - Tiles in the corridors and conference rooms in a coastal office building were discolored with non-uniform “dirt-like” areas. A few tiles have yellowish streaks indicating possible moisture problems. SOLUTION: ETS was retained to perform an audit and evaluate suspected electrostatic issues. Other non-electrostatic issues such as mold were first evaluated. ETS determined that static electricity was not the predominant issue causing the dust attraction. A report with conclusions and suggestions was issued.