A Summary of Environmental Performance

Texas Instruments, Incorporated
Materials and Controls
Attleboro-Mansfield Site

1998 Reporting Year

Cover Photo: TI-M&C products. ***Every day people around the world use products built with TI technology.***

This report has been compiled to satisfy, in part, the commitment of Texas Instruments Incorporated (TI), Materials & Controls division (M&C) under the EPA StarTrack Program. Consistent with the duties of a StarTrack Participant, this Environmental Performance Report satisfies one of TI's annual requirements.

This report has been assembled and edited by Michael M. Miller, Environmental Specialist and Special Projects Facilitator.

Technical advise provided by Raymond P. Lizotte, Jr., Senior Environmental Engineer and Manufacturing Liaison Manager.

Welcome

"The world we have created today as a result of our thinking thus far has problems which cannot be solved by thinking the way we thought when we created them." - Albert Einstein

It is my pleasure to welcome you to the Texas Instruments Incorporated, Materials & Controls division 1998 Report on the Environment. Albert Einstein's quote describes the situation in which the M&C Environmental, Safety & Health (ESH) Department found itself only a few short years ago. As many of us know, there exists an extensive array of regulations that dictate how a company, such as TI, should manage its environmental, safety and health programs. As a responsible company, TI has invested the necessary resources to create programs needed to ensure compliance with the numerous regulations and rules. The time has arrived in the ESH arena to look beyond the traditional goal of achieving overall compliance and pursue exciting opportunities that will add value to both ESH and business performance. As Albert Einstein suggests, the way to achieve such a challenging objective is though new and innovative ways of thinking and assessing that ultimately lead to new, innovative solutions.

During 1998, those of us in the M&C Environmental, Safety & Health organization have worked vigorously to move TI-M&C beyond a sole focus on just achieving compliance. While maintaining compliance is still a core ESH priority, the organization is looking beyond compliance requirements to methods of generating value from our excellence in environmental, safety and health performance. This new way of thinking can be described through a formula we call the "Competitive Value Equation." The objective of the Competitive Value Equation is to challenge each business function to understand its competitive value to the company. In other words, how ESH achieves a competitive advantage while providing faster and better services.

In the world of environmental, safety and health, the Competitive Value Equation is defined as:

- **FASTER: ESH programs that respond quickly to changing regulations, business conditions and significant risks.**
- **BETTER: ESH programs that achieve a higher degree of protection, reduction in risk, and greater value for the business.**
- **CHEAPER: ESH Programs that expend as few of TI's and society's resources**

One outcome of this approach is that regulatory compliance becomes one of several parameters by which value is measured and equal to other criteria for success, such as lower cost, alignment with business objectives, and speed. The M&C Environmental, Safety & Health organization has developed a formal process for ensuring that all these criteria are appropriately assessed and incorporated into the functioning of the M&C ESH programs.

The 1998 assessment resulted in four objectives designed to move TI M&C beyond compliance and to higher value generation:

- **Generate business value through Resource Optimization and Human Productivity Enhancement**
- **Partner with business initiatives such as Total Productive Manufacturing and New Product Development**
- **Provide Effective Risk Management Services (including Compliance Assurance)**
- **Improve and globalize ESH support within TI M&C**

This 1998 Report on the Environment describes the efforts by the M&C environmental, safety & health organization to generate greater value for TI and improve overall environmental, safety & health performance. We hope this report generates an ongoing communication and dialogue with all our stakeholders. Please do not hesitate to contact us about this report or any aspect of ESH performance at TI M&C.

Francis J. Veale, Jr.
M&C Environmental, Safety & Health Manager

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Manufacturing first started on site in 1926. M&C became part of TI in 1959

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TI is proud participant in the EPA StarTrack program

Profile: TI Attleboro Facility

StarTrack Snapshot of TI Facility

Facility Name: Texas Instruments Incorporated,
Materials & Controls division (TI-M&C)
Location: Attleboro, Massachusetts
Contact Person: Raymond P. Lizotte, Jr.
34 Forest Street, MS 10-02
Attleboro, MA 02703

Facility Overview: The Texas Instruments Incorporated, Materials & Controls, Attleboro, MA manufacturing location is a diverse industrial operation producing engineered materials and control/sensor devices serving the transportation, appliance, HVAC, industrial/commercial, and electronic/communication markets. The Attleboro, MA manufacturing facility is the headquarters for the Materials & Controls division of Texas Instruments Incorporated. The Attleboro facility currently employs 4,500 employees.

Reporting Period: Calendar Year 1998 *(January 1, 1998 through December 31, 1998)*
Date of most recent report: *Report on the Environment for Reporting Year 1997*

Who we are

TI-M&C serves the worldwide automotive, appliance, aerospace, industrial, electronics, and telecommunications markets. The company's electronic sensors and controls can be found in almost every home, many automobiles, heating, ventilation, and air-conditioning systems. Applications range from remote identification products to advanced steering systems and climate controls.

The Attleboro site resides on about 275 acres approximately one-mile northeast of Attleboro center. Twenty-five buildings with more than 1.5 million square feet are located on the 100 developed acres. The remaining property has been maintained in its undeveloped state, including about 60 acres of preserved wetlands.

TI-Attleboro wastewater treatment is served by a state-of-the-art facility, which handles over 400 gallons per minute of wastewater to levels well below drinking water standards. Forty-two significant and another fifty insignificant air discharge sources are regulated under the site's Clean Air Act Operating Permit. The site annually converts over 85 million pounds of metal into product at an efficiency rate greater than 95%.

M&C: A World Leader

We know what your thinking, TI makes calculators! Right?

Well you're right, but really TI is so much more. TI is a very diverse company with three distinct divisions Semiconductors (S&C), Materials and Controls (M&C), and Education and Productivity Solutions. S&C makes those incredibly fast DSP chips that make your cell phone work, while Education and Productivity makes those graphic calculators that you remember from high school Calculus.

Here at M&C we make all kinds of exciting products that have changed the way we live, from the sensors that help turn your steering wheel to the recognition systems that changed the way you get gas. We make safety products and the motor protectors that control your appliances. And as if that wasn't enough, here at M&C we make thousands of other products that surround you during your day at home, in your car, and at work.

DuraFoil

DuraFoil is material system, in a foil form, that was specifically created for the automotive catalytic converter market. This material is used as a honeycomb substrate to hold a washcoat that contains a precious metal catalyst. The washcoat cleans away smog producing elements when a hot automotive exhaust system is exposed to it.

DuraFoil is an exciting environmental product because it reduces emissions dramatically. Many of today's LEV and ULEV vehicles utilize this innovative technology to achieve low emissions.

CAS: Capacitive Low-g Accelerometer

Wow sounds important!

Our solid state acceleration sensor uses a metal beam capacitive technology that provides a linear voltage output proportional to applied acceleration. The CAS makes its way into some of the worlds finest automobiles.

Wow! And you thought we only made calculators!

TIRIS Tag-IT

First we changed the way you get you gas with Mobil Speedpass. Now we are changing the way you will get your packages. It's Tag-IT from TI.

It's a new generation of TIRIS: The Tag-it inlay transponder, is the basis for the first consumable smart label for industries needing quick and accurate identification of items. It's ultra-thin, battery free, and can be laminated between layers of paper and plastic.

Klixon Motor Protectors

These motor protectors as are part of an extensive line of products that work on single phase motor protection, 3 phase motor protection, and motor starters to serve an entire range of applications.

Klixon motor protectors provide ultimate protection in a variety of applications where motors must be shut down in danger of over heating.

Management Systems

EMS: Generating Value and Excellence

The first step in generating value from an environmental, safety, and health management system (EMS) is relatively simple. The organization must study their actions to determine why they need an EMS, whom does it serve, how they will know if and when the EMS is succeeding. While there are no definitive answers to these questions, it is in exploring and answering them that an innovative organization uncovers the methods for generating business value and improving environmental performance.

For many years, TI has been conducting reviews of the programs it employs that assure compliance with environmental rules, and of the management systems that impel continuous improvement. Ever since its selection to the EPA, Region 1 Environmental Leadership Program, TI-M&C has utilized the StarTrack Project as a driver to upgrade organization-wide environmental, safety and health performance, enhance its compliance assurance processes, and link improving the environment with improving business performance.

In 1997, TI completed two detailed assessments of its environmental management system. The first assessment was completed as part a requirement for the StarTrack Program and the second assessment was completed as part of a benchmarking study sponsored by Stanley Works. The outcome of these assessments provided a detailed model of the existing management system, a gap analysis between the existing system and the ISO 14001 management system model, and a gap closure plan. In June 1998, Cahaly Environmental, the environmental management system assessment firm retained by TI for the Star Track project, provided its formal StarTrack report on the status of the Attleboro/Mansfield site ESH Management System. Although the current management system is not in complete conformance with ISO 14001, a majority of the ISO 14001 management system elements have been achieved.

The existing management system model provides basic ESH services with a number of self-contained processes, called "modules", each managing a specific ESH issue or regulation. The Advanced Wastewater Treatment Operation Module, which addresses all of the site's wastewater requirements, is an example of one of these modules. At the TI-Attleboro facility, about 50 of these ESH service modules are incorporated into the management system. While each module addresses a specific media or issue, the existing system relies on ESH experts to recognize how the modules under their control relate to business and ESH objectives. It is also these content experts who identify ESH aspects, establish program plans, specify targets achievable within their modules, and make the appropriate recommendations for allocation of resources. An ESH leadership team composed of these ESH experts acts as the interface between the ESH process modules, the businesses, and TI upper management.

The TI ESH Policy on the following page is our response to these questions and is intended to keep everyone at TI heading in the same direction. It is the foundation to the TI-M&C effort to have the ESH management system at each manufacturing location recognized as a valuable asset that generates value for the business and the environment.

TI ESH Policy

Texas Instruments Incorporated responsibly manages operations. TI's products and services are provided with the concurrent goal of *enhancing* the quality of life for customers and employees and progressively *reducing* the potential ecological impact of its activities by *focusing* on productivity and eco-efficient processes.

TI Environmental, Safety and Health Principles

1. Management and Employee Commitment and Accountability:
Employees at all job levels are required to follow environmental, safety and health (ESH) procedures appropriate to their function in support of TI's Policy and Principles. Regular management review of compliance with this policy and progress against objectives and targets is performed, and corrective actions developed and deployed where needed. ESH awareness training is an integral part of each individual's training and development plan. TI embraces responsibility for the outcomes of our operations and is accountable for appropriate responses.

2. Risk Assessment of Activities and Processes:
The potential impact of our activities on the environment, and safety and health of our employees is assessed in advance. Operations are conducted in compliance with applicable laws and regulations. TI also develops and implements environmentally responsible manufacturing processes.

3. *Natural Resources and Energy Conservation*:
TI's goal of zero wasted resources supports the sustainable use of natural resources and the efficient use of energy and raw materials. Until zero waste is achieved, all waste is handled, transported and disposed of in a safe and responsible manner. Efficient energy use throughout our businesses includes harnessing cost-effective sustainable energy resources.

4. Emergency Preparedness:
TI is an environmentally responsible company and is prepared for emergencies. Leadership is provided to assist our local communities with improvement of their emergency preparedness.

5. Product Stewardship:
TI develops and manufactures products, responsibly managing their potential impact on the environment, safety and human health. Our customers are provided with appropriate information on safe use, recycling and safe disposal at the end of the product's useful life.

6. Supplier and Contractor Relationship:
Long-standing partnerships are promoted with suppliers to achieve TI's goals of zero wasted resources and zero injuries and illnesses from the use of manufacturing equipment and materials. TI expects the same level of ESH performance from contractors working at TI sites as from its own employees.

7.Public Information and Influence on Public Policy:
Information concerning our environmental, safety and health performance is released to the public. TI promotes an open dialogue with our workers and the communities in which the company operates. We work constructively with governments, the scientific community, industry and public interest groups to develop sound laws, regulations and guidelines for continuous improvement in environment, safety, and health while promoting global competitiveness.

Thomas J. Engibous
Chairman of the Board, CEO, and President

Attleboro Safety Policy

Safety is the preservation of our most important asset: People. As such, safety is an integral part of business excellence and is equivalent in significance to quality, strategic growth, and profitability.

Site Safety Principles:

- Management will provide a safe work environment
- All injuries and occupational illnesses can be prevented
- Training is an enabler of safe working practices
- Working safety is a condition of employment
- Zero injuries is our goal

Site Pollution Prevention Policy

Texas Instruments recognizes that the generation of wastes, and in particular, hazardous wastes, represents process inefficiency in TI's efforts to create, make and market useful products and services. TI will strive to continuously improve the efficiency of its manufacturing capability by reducing unwanted byproducts from its manufacturing operations.

Guiding Principles:

1. To establish Pollution Prevention as the preferred method of complying with environmental initiatives.

2. To conserve TI resources through efficient use and careful planning.

3. All Pollution Prevention Projects must be analyzed utilizing accepted financial analytical techniques

4. To provide Training as an enabler to improve process efficiency.

TI ESH Compliance Policy

It is TI policy to provide a safe, healthy workplace and protect the environment while complying with all applicable laws and regulations. The Company shall conduct all business in a manner that will ensure protection of the environment, employees, and the communities in which we operate. (Corporate SP&P 04-04-21)

Compliance

Achieving compliance with ESH regulations was once perceived as the ultimate performance achievement that a company, such as TI, could attain. Today compliance is viewed as a minimum acceptable standard. If you don't maintain compliance, it's like trying to drive a car without four wheels. You ultimately will not get very far. However, the fact that a car has four wheels and a roof does not provide enough purchasing incentive in the marketplace. A car that provides additional features above the minimum, like a premium stereo or power windows has the significant extra value that attracts buyers. Similarly, compliance no longer provides a company, like TI, with a competitive edge. In addition to just maintaining compliance, a company needs to pursue further endeavors to attain the rank of an Environmental Leader.

Going "Beyond Compliance" means taking additional steps today to reduce future risks and conceivably assist in the development of effective regulations. Minimizing risk areas results in fewer and less severe negative events, like accidents, spills, and releases. However, unless these returns are obviously linked to business value, they are perceived as providing value only in the ESH arena. Future-focused ESH investments are treated as optional, a non-essential luxury to be indulged in when times are good. This makes these kinds of initiatives an easy target for cutbacks when times get hard.

But, in fact, most future-focused ESH activities are linked to business value. In the TI automotive sensor business, many products have originated from the efforts of the automakers to meet environmental fuel efficiency requirements. Going back in time to the beginning of this century, the TI-M&C motor protector business derived from government regulation aimed at safely using electricity. These are examples of ESH issues providing a unique competitive advantage that M&C has boldly pursued.

Many ESH activities indirectly support business strategic objectives and operational effectiveness. Getting permits faster so new products can hit the market faster, and identifying potential new markets, such as the indoor air quality sensor products, are just two examples. The key is linking the business objective to the ESH objective. To make this happen, the ESH organization seeks to maintain a greater awareness of the evolving business objectives.

Performance

Stewardship

TI's Definition of Product Stewardship

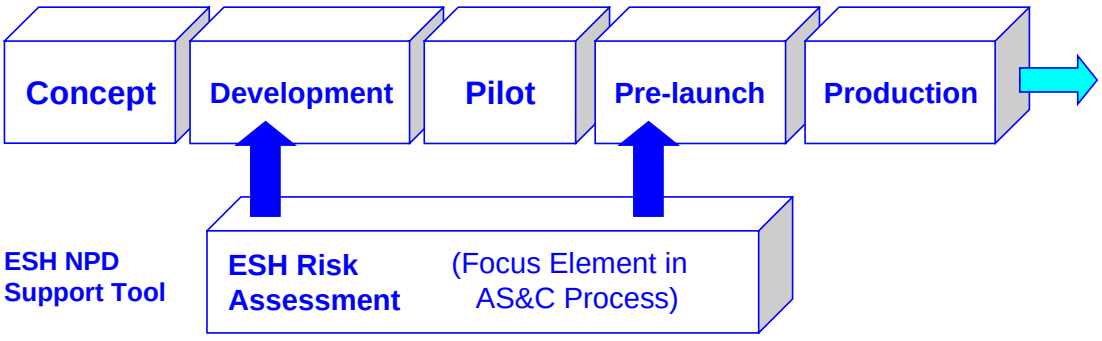
TI develops and manufactures products, responsibly managing their potential impact on the environment, safety and human health. Our customers are provided with appropriate information on safe use, recycling and safe disposal at the end of the product's useful life. ***(TI ESH Policy, page 7)***

The stewardship principle incorporated in the TI ESH Policy encourages all TI employees, contractors and suppliers to understand how their actions and decisions influence the ESH life-cycle impacts of TI products and services. The ultimate goal is to integrate environmental, safety & health considerations into the design, manufacture, distribution, use and disposition of products, packages, and processes to achieve business benefits on one hand and environmental improvement on the other hand. Whether it be the R&D scientists who are inventing new products, the design engineers who specify the materials of construction, or the manufacturing engineers who establish the technology that will make the product, all TI technical personnel have a role in this endeavor. Responsibility doesn't end with the technical staff – other functions, such as Purchasing, Facilities, Supervision, and even Suppliers, all play important parts in ensuring that TI products reduce their impact on the environment.

Many of the TI-M&C product lines offer an ESH performance attribute to our customers. For example, DuraFoil is a material system that supports the auto industry efforts to manufacture lower emission vehicles. Likewise, many of the TI control products are essential components of the safety systems of electrical devices. TI-M&C has made a major commitment to ensuring that the manufacturing processes that are used to make these products are environmentally sound. Through extensive pollution prevention efforts, TI engineers continuously strive to make existing operations better. This has often meant developing entirely new and toxic-free ways of manufacturing our products.

Through a recently formalized design for the environment (DFE) initiative, TI engineers are also incorporating ESH criteria into new products. TI has developed an ESH, New Product Development (NPD) support tool that provides a formal method of considering ESH issues during the TI NPD procedures.

New Product Development (NPD) Procedures



ZERO-ZERO Goals

The TI ESH Policy provides the overall guidance to TI ESH efforts; however, to connect with day-to-day operations, a more measurable approach is necessary. This has been accomplished through the Zero-Zero goals – Zero Wasted Resources and Zero Injuries/Illesses. The Zero Wasted Resource goal strives for 100% process efficiency by reusing, recycling and regenerating any material not incorporated into our products. Its goal is to release zero contamination to land, air or water, and to achieve the best attainable level of energy efficiency. The Zero Injuries/Illnesses goal seeks to obtain 100% productivity by eliminating all occupational and preventing non-occupational injuries/illnesses. Performance in achieving the Zero-Zero goals is found in the Metrics section of this report.

The following are examples of several key projects conducted in 1998 to achieve the Zero-Zero goals:

Furnace Atmosphere Conversion Project: During the 1998 July 4th holiday shutdown, the Attleboro site completed a furnace atmosphere conversion project. Site annealing furnaces utilize a mix of N_2/H_2 as a reducing atmosphere. Traditionally, the N_2/H_2 gas was supplied by breaking anhydrous ammonia into nitrogen and hydrogen. The Attleboro site had an average annual use of this toxic gas of over 2,000,000 lbs. Three years ago, a site Pollution Prevention team investigated supplying the required furnace atmospheres by combining liquid hydrogen and nitrogen rather than dissociating the anhydrous ammonia. In the intervening years, a liquid hydrogen tank was permitted for the Attleboro site and the site furnaces were upgraded.

Financial Highlights:

	Cost Savings ($K)
Annual Energy Cost Savings	100
Annual Chemical Cost Savings	20
Estimated Annual Product Yield Improvements	20
Avoided Compliance Costs (112r - Risk Management)	125*

* one time avoidance

Other Benefits: The primary environmental benefit of this program was the reduction of over 2,000,000 lbs of anhydrous ammonia use. Also, because the anhydrous ammonia system had been large enough to trigger Clean Air Act, Risk Management Planning (112r) thresholds, the furnace atmosphere conversion project allowed the site to avoid these onerous regulatory requirements (projected as a 1999 Cost Avoidance). From a Safety perspective, TI's insurer has indicated that the new N_2/H_2 supply system is "magnitudes safer" than the anhydrous ammonia system it replaces.

High Vacuum Vapor Degreasers: High Vacuum Vapor Degreasing (HVVD) is a cleaning technology in which solvent cleaning is performed within a vacuum chamber. By not allowing solvent and air to mix, HVVD technology does not suffer from the problems associated with conventional open top vapor degreasers. For example, HVVD cleaners do not require the extensive cooling coils contained within conventional degreaser to remove solvent from air and are therefore more energy efficient. Additionally, because the cleaning occurs in a closed vacuum system, the only losses of solvent are the small puffs that occur when the chamber is opened and minor quantities in still bottoms. These units are extremely efficient users of solvent and require up to 90% less input solvent. The major drawback to this technology is the high, up-front capital expense.

Financial Highlights:

	Cost Savings ($K)
Annual Energy Cost Savings	12
Annual Chemical Cost Savings	61.5
Annual Waste Disposal Cost Savings	8
Avoided Compliance Costs	16
Estimated Avoided Permitting Costs	14*

* one time avoidance

Other Benefits: HVVD technology allows for continuation of the use of solvent in M&C Core Processes for which a suitable non-solvent technique has been not developed. Because of the availability of this technology, the M&C businesses were not adversely impacted by Clean Air Act restrictions on solvent cleaners. As the following table shows, solvent use has been greatly reduced over previous year's usage related to the replaced conventional vapor degreasers.

1998 Solvent Use (lbs)			
Unit Name	**Purchased**	**Recovered**	**Emitted**
IMT Plating	2,155	2,112	42
Disc	3,984	3,966	17

1997 Solvent Use (lbs)			
Unit Name	**Purchased**	**Recovered**	**Emitted**
IMT Plating	63,775	30,297	33,478
Disc	23,915	19,332	4,582

HVVD technology is not subject to the Subpart T NESHAP requirements for Halogenated Solvent Cleaners; thus, reducing the annual compliance costs per degreaser (estimated to be approximately $8K greater per unit over what is currently being allocated). Additionally, Since HVVD technology uses solvent in such small quantities, these units can be permitted in Massachusetts under the small cleaner (i.e., monthly solvent consumption of less than 100 gallons per month) exemption.

1998 Power Deal (Electricity, Oil, Natural Gas): Taking advantage of the Massachusetts electricity and related oil/natural gas deregulation laws, the Attleboro/Mansfield site has entered into contracts that will have significant impact on overall energy costs at the site. On the electricity side, the site has entered into an agreement with Alternate Power Source Inc. of Westwood, MA and TransCanada Power Marketing Ltd. of Westboro, MA. The one-year, renewable agreement provides both electric capacity and electricity to M&C manufacturing facilities (note that Mansfield is not covered because that site is served by a municipal electric system). On the fuel side, the site has entered into an agreement with Global Energy Services of Waltham, MA. The multi-year agreement provides a fixed price for natural gas and fuel oil.

Benefits: Both of these contracts represent a "first of its kind" under recently enacted Massachusetts deregulation rules. Under the electricity agreement, the source of power supplied to M&C will be a 550-megawatt, gas-fired plant. This is a more environmentally sound generation arrangement than the oil and coal fired plants that provided a majority of the site's electricity prior to the agreement. Under the fuel agreement, the fuel supplier has the ability to provide TI with not only the lowest cost fuel, but also the most environmentally sound fuel. For example, during 4Q98, Global Energy Services provided lower sulfur #6 fuel oil as a substitute for the usually less costly high sulfur #6 fuel oil at the fixed price cost. Both contracts have resulted in reduced regional environmental loading due to the power needs of the Attleboro facility. Based on the site's Air Pollution Source Registration submission to the Massachusetts Department of Environmental Protection, this fuel switch resulted in a 35-ton reduction in regulated sulfur dioxide emissions.

Manufacturing Process Optimization: This project replaced a 200-hp air compressor that was required to support the manufacture of PTC product area (Production Unit 039 in the TI Toxics Use Reduction Program) with two 10-hp compressors. The project involved a multi-functional team from the service and manufacturing organizations to make the process changes that allowed this major conservation project to take place.

Financial Highlights:

	Cost Savings ($K)
Annual Cost Savings	48

Other Benefits: In addition to excellent financial performance, this project reduced site electricity usage significantly, reduced the air-line pressures (thus reducing opportunity for accidents), and improved processing performance of the PTC manufacturing area.

Wastewater Treatment Optimization

A recently completed benchmarking survey showed that M&C's wastewater treatment (WWT) operation is a highly valuable asset that provides a significant competitive advantage to M&C. The WWT operation has been designed to provide the highest quality service to the M&C businesses that generate wastewater. In the world of treating wastewater, quality service is defined as operating without interruptions, accepting a broad spectrum of waste streams, maintaining a stellar regulatory compliance record, and providing the service "cheaper" than the competition.

It is the cost effectiveness of the WWT operation that is of greatest value to the M&C businesses. The benchmarking survey, which compared the WWT operation with that of 29 major competitors, demonstrated that the operation compares favorably to the industry average in 9 of 11 benchmarked cost categories, and for overall operating cost. Much of the cost competitiveness can be attributed to the aggressive cost reduction programs initiated by the WWT staff - for example, $200K of savings in 1998 and over $350K projected for 1999. Through such cost savings, and despite the ever increasing cost of treatment chemicals and sludge disposal, the WWT operating budget has progressively decreased from approximately $3.0M prior to 1997 to $2.7M in 1998.

Even with such a good story to tell, the WWT operation is continuously striving to improve its competitive value position toward faster, better and lower cost services for the M&C businesses. To pursue the opportunities for continuous improvement, the M&C Environmental Department has established a site-wide task force to promote WWT optimization. With its focus on addressing the needs of the businesses generating wastewater, participation by the three largest wastewater-generating departments on the Attleboro site, is central. A principle objective of the task force in 1999 is to identify and implement cost reduction opportunities that will achieve a step-function improvement in operating cost, ideally, with little or no additional investment. In the end, the success of the WWT Optimization Task Force will depend on the creativity and entrepreneurial spirit of the participating members. We have every confidence that we have assembled the right team to achieve optimal utilization of the M&C WWT operation.

The current plant was built in 1987. This complex facility cleans water beyond the Safe Drinking Water Act standards.

Solid waste from this facility, with its significant metal content, is recycled as a renewable resource.

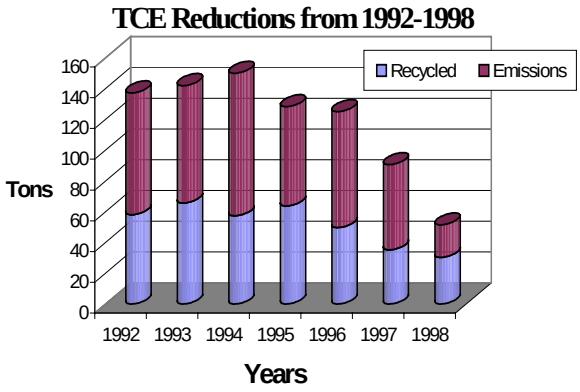
Solvent Reduction

One of TI's major environmental programs has been the Solvent Reduction Program. This program has been ongoing for 15 years now. Since 1984, when the Trichloroethylene (TCE) Elimination Task Force was first deployed, significant reductions in overall TCE use have been seen on site. With the additional goal of phasing-out the use of Ozone depleting substances between 1989 to 1993, TI has made an enormous effort to comply with all the requirements of the Clean Air Act. The site is continually striving to eliminate the use of TCE and other halogenated solvents.

The objective of this program is to reduce perceived M&C over-reliance on halogenated solvents, primarily TCE, in its manufacturing processes.

Program Tactics:

- Phase out when it is technically feasible and makes good business sense.
- Phase out as required by law (ozone depleting substances)
- If use of solvent is the only technically feasible choice, then reduce, reuse and recycle.
- If a technically feasible alternative is too costly, then reduce, reuse and recycle and continue to search for a better alternative.



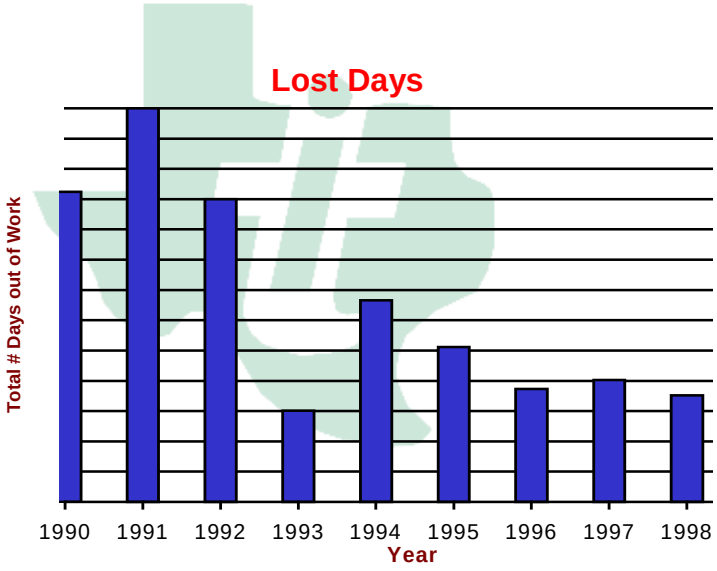
1998 represented one of the most successful years in M&C's trichloroethylene elimination efforts. While there is still quite a bit of work to be done, the recent successes have gone a long way toward realizing M&C's 1984 goal of reducing reliance on trichloroethylene in manufacturing operations.

During the early years of the program, between 1984 and 1990, the number of TCE degreasing operations decreased from 39 to 14 and TCE usage was reduced by 75%. In 1990, the TCE Elimination Task Forces were absorbed into the site's Toxic Use Reduction (TUR) Program. Since 1990 the number of operations utilizing TCE has been reduced an additional 50%, from 14 to 7.

The general TI-M&C TUR program, which includes toxic chemicals regardless of regulatory reporting requirements, is a team-based effort in which all employees have the opportunity to participate. While there are formal TUR representatives within each of the major business divisions, the generation and implementation of TUR options are not the exclusive responsibility of any one organization within the company. For example, the elimination of ozone-depleting substances required a major change in technology platforms used to manufacture electronic connections, and the businesses assumed full responsibility for developing and implementing TUR options (completed in 1994).

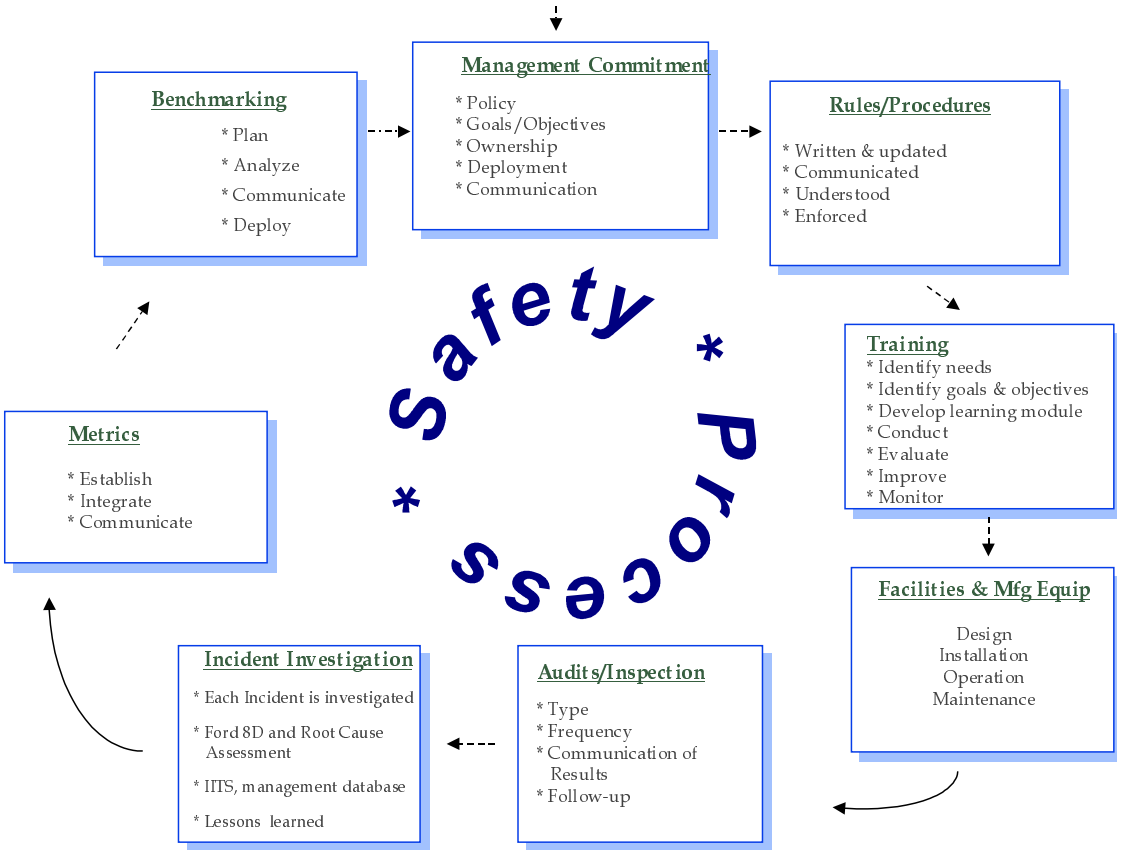
Health and Safety

The importance placed on protecting employee safety is a direct reflection on M&C management's basic belief of the value of people as a vital resource. 1999 Goals for lost day cases call for a 40% decrease from 1998.



The recognition of workplace hazards has always been paramount in TI's strive for excellence. M&C Management has established a site safety policy, and has developed safety goals and objectives to eliminate hazards to TI employees.

Each business group on site has an established safety committee. The safety committee meets monthly and ensures that safety processes are deployed.



Operational Excellence with

Improvement in operational excellence is a top priority for Materials & Controls. It will help generate the profits needed to invest in and grow business for the future. TPM is the major tool M&C is using to achieve operational excellence.

Total Productive Manufacturing (TPM) targets improving the efficiency of manufacturing operations by eliminating all defects that prevent equipment from operating perfectly 100 percent of the time. TPM's goal is the total elimination of breakdowns, losses and accidents.

Benefits of implementation of TPM include the following:

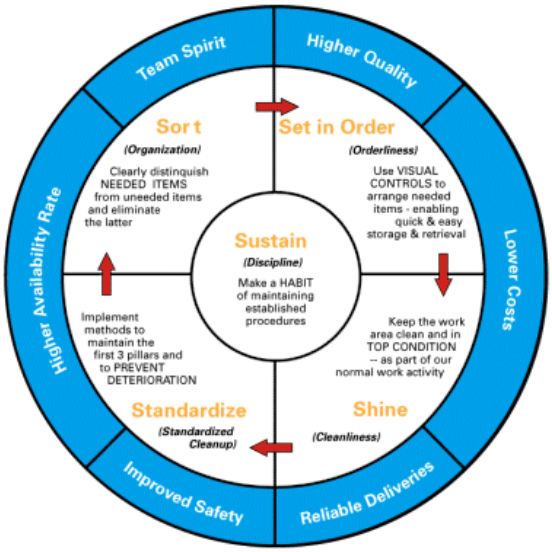
- Fewer defects
- Higher yields
- Reduced RMRs
- Improved cycle time
- Reduced inventories
- Reduced downtime
- Fewer breakdowns
- Reduced Work In Process
- Fewer quality problems
- Fewer employee injuries
- Less pollution and waste
- Work area improvements
- Greater teamwork and better communications between functions
- More orderly and better controlled processes.

The TPM Model used at the TI-Attleboro site is shown below:

TPM Model

The foundation to TPM is implementation of the 5-S process. The 5-S process: *workplace organization, orderliness, cleanliness, standardization and discipline will improve effectiveness and reduce waste throughout the company.*

ESH recognized the importance of being integrated into the business's priorities. ESH took an active role in assisting the businesses in achieving their 5S objectives.



ESH established Goals that could be measured as a result of TPM implementation. These goal are:

- Leverage 5S process to drive safety improvement
- Provide a timely, cost-effective method to achieve hazards reduction
- Ensure minimum injuries during TPM implementation
- Support reduction in Fire and Injury rate as result of 5S or Autonomous Maintenance implementation.

In 1998, the following actions were competed to support ESH integration into the TPM process.

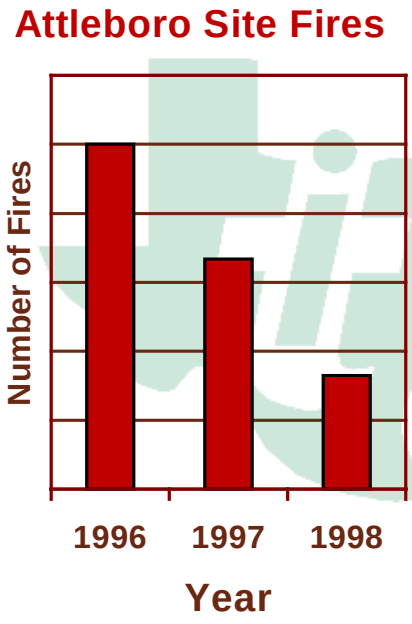
- ESH involvement in TPM business steering committees-
- ESH training incorporated in 5S training
- ESH assessment tool developed
- 5S certification criteria modified to incorporate use of ESH assessment tool
- 75 Baseline ESH assessments completed using ESH assessment tool-
- ESH assessment tool kit for training of 5S team for self auditing developed and deployed
- Integrated ESH training into Autonomous Maintenance Training modules

During 1999, the following actions will be performed to continue integration and hazard reduction.

- Complete 125 ESH assessments (Baseline & Sustain)
- Support Safety reviews for Autonomous Maintenance Projects
- Utilize TPM focus improvements with OEE/Ergonomics Project
- Utilize machine guideline in Early Equipment Pillar
- Consolidate numerous business ESH audits into single standardized ESH assessment tool.
- Analyze 5S results and share where appropriate to drive change
- Achieve 50% hazard reduction during post ESH assessments

TPM implementation will take several years to be fully deployed throughout the Attleboro site. Reduction in ESH hazards, sustained compliance to regulatory standards, improved housekeeping, orderliness and productivity are already being realized in some areas.

Fire Reduction



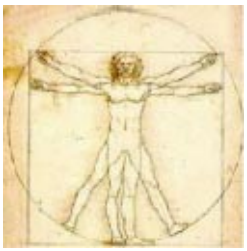
Over the past few years the safety department has lead a mission to reduce the number of fires at the Attleboro site. Two years ago procedures to prevent the causes of fires were deployed. This included training employees and supervisors on fire prevention, auditing manufacturing areas to eliminate the causes of fires, conducting 8D investigations of fires that occurred, and involving Factory Mutual in equipment process evaluation. Through these efforts the site has seen a dramatic 61% decrease in the number of fires on the site in the past two years.

Ergonomics

TI-Attleboro has excelled is in the ergonomics arena. The site has had an Ergonomics Program for many years, but most recently, it has begun to be recognized as a Benchmark throughout New England, and internationally at other TI locations.

In 1996, The Ergonomics Program was recognized by the International Facility Management Association, Boston Area Chapter as an Ergonomics Program "that exemplifies the pursuit of excellence in facilities management".

The key to the M&C Ergonomics program is it's "Focus on Integration", as part of TI's Best Practices. The intent of the M&C Ergonomics process is to develop a long-term ergonomics program that can service the diverse businesses within M&C, will be flexible as business requirement change, and will be independent of any single champion. This model differs from traditional ESH programs because of its direct integration into actual business processes. Another core focus of the Ergonomic Program is to develop ergonomic work environments and work practices through employee participation facilitated by a central resource.



Ergonomics: The science that studies the relationship between people, their tools, workstations, and the environment that surrounds them.

Operational Metrics

Approach to Operational Metrics

TI, in addition to complying with all regulations, pursues a voluntary goal of reducing emissions of chemicals to the environment, waste, energy, and water usage. This performance report provides the opportunity to present a profile of TI operations and performance to interested external stakeholders – especially communities – as a complement to the Star Track compliance assurance and management systems audit reports.

This voluntary Environmental Annual Report presents safety and environmental performance figures compiled from our Attleboro and Mansfield, Massachusetts manufacturing facilities. The TI M&C site is a large, diverse manufacturing location for which a single normalization factor is not appropriate. Consequently, the operational metrics are based on absolute data unless otherwise indicated. Note that the site has validated data for energy and water use for the past two years.

The operational metrics reported in this section are based on the Star Track Enviromental Performance Reporting (EPR) guidance issued in May 1999 to cover the 1998/99 Star Track cycle.

This section is divided as follows:

Inputs:
- Energy Use
- Water Use
- Toxic Chemical Use

Outputs
- Emissions to Air including Greenhouse Gases
- Emissions to Water
- Hazardous Waste Generation
- Non-Hazardous Waste Generation

This report should be viewed as a companion to the TI-wide Annual Environmental, Safety and Health Performance Report located on the TI web page at http://www.ti.com.

Energy & Water Use

Total Energy (Electricity and On-site Fuel Usage)

	1997	1998	97:98
Total Energy Usage (million BTUs)	1,140,144	1,008,977	-13%

Electricity

	1997	1998	97:98
Total Electricity Usage (million KWH)	124,761	117,699	-6%
Total Electricity Usage (million BTUs)	425,700	401,604	-6%

Source of Electricity (From Local Utility, 1998)

Source	%
Hydroelectric*	10
Coal	38
Natural Gas	22
Nuclear	14
Oil	10
Renewable Sources	6

* 50% from Quebec

On Site Fuel Usage

	1997	1998	97:98
#6 Fuel Oil (million BTUs)	566,997	472,012	-17%
Natural Gas (million BTUs)	147,447	135,381	-8%
Total Fuel Usage (million BTUs)	714,444	607,393	-15%

Water Consumption

	1997	1998	97:98
Total Water Use (thousand gallons)	292,500	259,775	-11%
Process Water (thousand gallons)	165,250	145,500	-12%
Other Water Use (thousand gallons)	127,250	114,275	-10%

Water Discharge

	1997	1998	97:98
Total Discharge (thousand gallons)	254,750	232,716	-9%
Process Discharge (thousand gallons)	136,500	121,350	-11%
Other Discharge (thousand gallons)	118,250	111,365	-6%

Toxic Chemical Use

The U.S. Superfund Amendments and Reauthorization Act of 1986 and the Massachusetts Toxics Use Reduction Act listed several hundred chemicals for which companies are required to report releases to the environment as part of the U.S. EPA's Toxic Chemical Release Inventory and Massachusetts Toxics Use Reduction Reports. The table reflects the data TI has reported to the EPA and the Massachusetts Department of Environmental Protection through 1998.

Toxic Chemical Use (SARA 313 and TURA reportable chemicals)

	1996	1997	1998
Ammonia Compounds	1,590,000	1,830,000	492,000
Barium Compounds	140,000	155,000	126,000
Cadmium Compounds	8,780	10,400	8,270
Chromium & Chromium Compounds	341,000	177,000	134,000
Copper & Copper Compounds	8,540,000	9,530,000	7,650,000
Cyanide Compounds	35,900	26,600	18,700
Ferric Chloride	247,000	266,000	256,000
Ferrous Sulfate Heptahydrate	183,000	211,000	88,000
Hydrochloric Acid	143,000	231,000	65,000
Methanol	13,200	2,000	1,000
Nickel & Nickel Compounds	2,420,000	3,980,000	3,630,000
Nitric Acid	34,800	34,500	33,600
Potassium Hydroxide	99,700	115,000	63,000
Silver & Silver Compounds	350,000	196,000	140,000
Sodium Hydroxide	731,000	706,000	660,000
Sulfuric Acid	794,000	791,000	711,000
Trichloroethylene	347,000	204,000	103,000

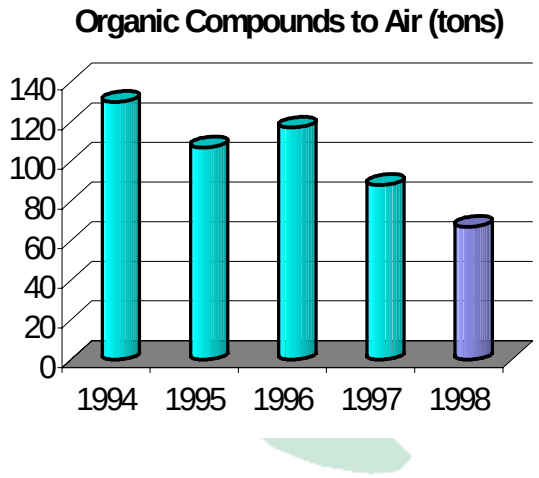
* rounded to two or three significant digits (as appropriate)

Ozone-Depleting Substances: The TI-Attleboro site phased out the use of ozone-depleting substances in manufacturing operations in 1993. Several closed-looped chiller/refrigeration units that are scheduled for replacement continue to utilize ozone-depleting refrigerants.

Polychlorinated Biphenyls (PCBs): The TI-Attleboro site phased out the use of PCBs from site electrical transformers prior to 1990.

Asbestos: At the time that many of the buildings at the Attleboro site were constructed, asbestos was a common construction material. As a result, many of the site buildings contain asbestos. The site has conducted an asbestos review, labeled all areas containing asbestos, and planned for the eventual removal of this material.

Emissions to Air



TI has established an aggressive program to reduce the quantity of volatile organic compounds (VOCs) emitted to the atmosphere. The objective of this program is to achieve a 15% reduction in annual organic compound emissions and ultimately reduce site VOC emissions to less than 25 tons per year by the year 2001.

A majority of the site's emission of criteria air pollutants is the result of fuel combustion at two utility plants and the generation of furnace atmospheres for the M&C Engineered Materials business.

Emissions to Air (all data in tons)

Pollutant	1996	1997	1998	Potential to Emit
Particulate	43	45	35	102
SO_2	221	475	439	1,443
NO_x	118	117	87	376
CO	539	539	449	1,447
VOC	117	88	67	330

NO_x : Reported as NO + NO_2
Particulate: less than 10 micron in size.

Emissions of Greenhouse Gases (all data in tons)

For the first time, the TI-M&C Attleboro site is assessing its overall impact on global warming by estimating the equivalent CO_2 emissions of its on-site fuel combustion activities and off-site electrical generation. The emissions of greenhouse gases reported in this section are based on methodology derived from "Greenhouse Gas Emissions from Management of Selected Materials in Municipal Solid Waste," EPA530-R-98-013.

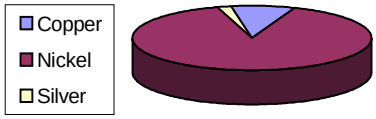
Source	1998 (lbs)
On-site Fuel Combustion	79,800,000
Off-site Electrical Generation	124,000,000
TOTAL	204,000,000

Emissions to Water

The Attleboro site Advanced Wastewater Treatment Facility (WWTF) discharges directly to Cooper's Pond (the NPDES Discharge to the Taunton River Watershed), and to the Attleboro Publicly Owned Treatment Works (POTW). The TI-M&C Attleboro WWTF has the treatment capability to treat the wide range of metal wastestreams generated by the metal processing and plating operations located at the site. Wastestreams with chelating compounds are directed to the Attleboro POTW after on-site treatment. The facility maintains on-site QA/QC capability and is staffed by excellent cadre of highly trained, licensed operators. Applying the Competitive Value Equation to the treatment of wastewater has resulted in operating without business interruptions, accepting a broad spectrum of waste streams, maintaining an unblemished regulatory compliance record, and providing the service for a lower cost than the competition.

Over the past ten years, TI M&C has been able to reduce the overall amount of heavy metals released to Coopers Pond, its National Pollutant Discharge Elimination System (NPDES) out-fall location. In 1986, the quantity of the three indicator metals: copper, nickel and silver, discharged from this out-fall was over 5,000 lbs. In 1998, the quantity of these metals discharged to the out-fall was only 151 lbs. This reduction was attained through a state-of-the-art wastewater treatment plant that began operation in 1987.

1998 Metal Discharge, Out-Fall 003



151 lbs of three indicator metals was discharged from the Advanced Wastewater Treatment Facility in 1998. This compares with over 5,000 lbs in 1986

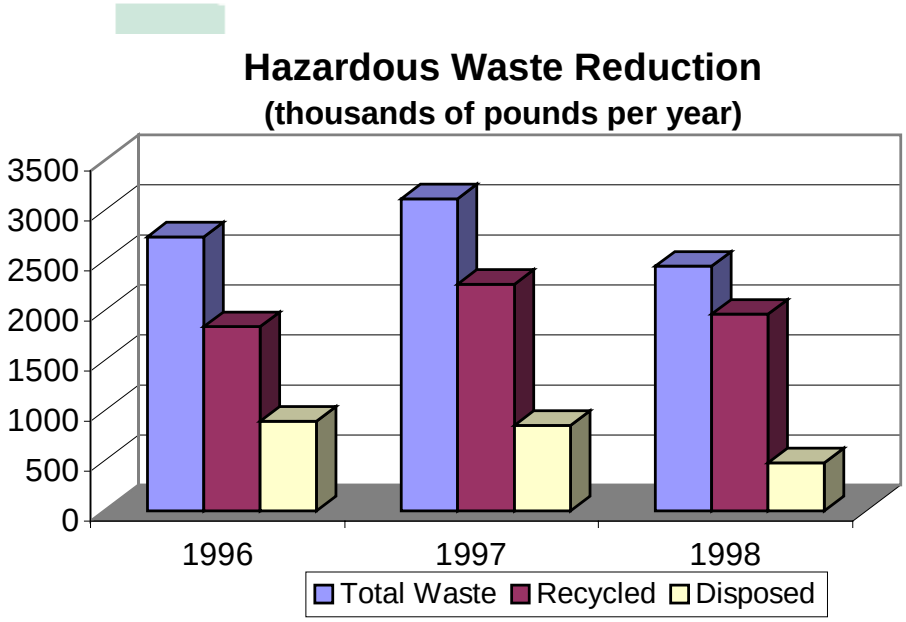
A change is occurring in the way in which the site manages, treats, and discharges wastewater from its manufacturing operations. During 1998, a number of pollution prevention and water conservation projects reduced the amount of water discharged and the total metals loading. Although this has had the affect of reducing the environmental burden, it has resulted in the need to change the operational structure of the Advanced WWTF. During 1998, benchmarking and several engineering studies were conducted which have identified action steps to reduced water flow conditions.

Priority Heavy Metal Discharges (pounds)

Pollutant	1996	1997	1998
Aluminum	116	86	63
Cadmium	3	2	2
Copper	18	15	13
Chromium	8	8	7
Lead	12	10	8
Nickel	88	95	135
Silver	4	3	3

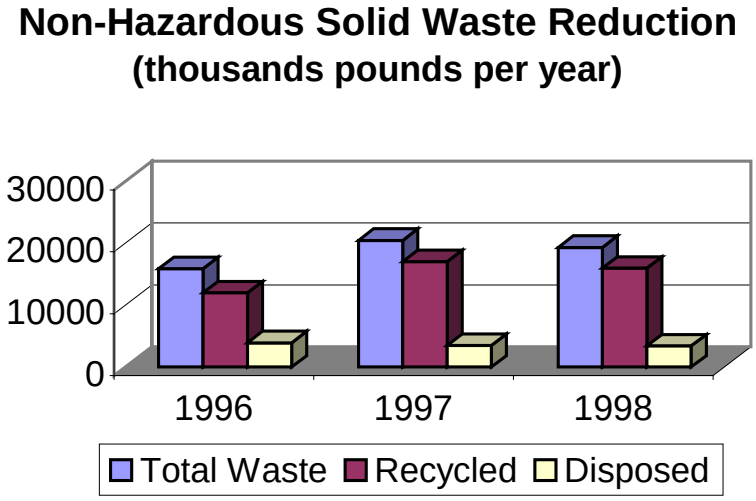
Hazardous Wastes

Target 15% Reduction in Hazardous Waste
Achieved 86% recycling rate, a 19% improvement from last year



Non-Hazardous Solid Wastes

Target 15% Reduction in Non-Hazardous Solid Waste



Community & Outreach Programs

It's A "World in Motion"

The M&C Engineering Council and the ESH Department are sponsoring the World in Motion program in all fourth grade classes within the city of Attleboro's school's. World in Motion is an award winning program intended to promote an interest in math and science in youngsters. Twelve TI engineers have been volunteering their time to help the teachers awaken in children, the sense of wonder and excitement about the world around them.

Using the World in Motion program, students study abstract science and math concepts in an applied manner that is fun and exciting. The intent is to motivate students at an early age to consider pursuing careers in science and engineering.

"A World In Motion" is one of the largest and most comprehensive private, nonprofit, volunteer initiatives in the United States designed to support science education. It uses a professionally developed kit of teaching materials provided by Society of Automotive Engineering (SAE). The experiments performed in the TI program focus on the construction of small sailboats. Over a period of three weeks, the students are introduced to the concepts of friction, aerodynamics, force and measuring. Based on what they learn of these concepts, they design sailboats. Each group of students is provided with materials to construct their craft. They test their designs and use the "feedback" to make modifications that result in a boat that will travel the furthest on a track. The grand finale is the Regatta at which each group races their sailboats against those of the other groups. At the end, each student receives a Citation of Achievement and a TI Calculator. TI employees volunteered over 150 hrs in 1998/99.

Earth Day and Audubon Society

At the request of the Attleboro branch of the Massachusetts Audubon Society (MAS), the TI-M&C Attleboro ESH group holds the proud distinction of serving on the Advisory Committee to the MAS-Oaknoll Sanctuary in Attleboro. TI is privileged to serve in this role for such a well respected environmental organization, that happens to be the oldest in the nation, and the largest in New England.

TI's association with MAS has also included such activities as sponsoring an annual Bird-Seed Sale and assisting with programs to manage flora and fauna in an environmentally responsive manner. By far the most prominent role of MAS is their contribution to TI's annual Earth Day Celebration including on-site guided nature walks and instructional programs for children.

TI Attleboro celebrates Earth Day every year in mid April. The festivities vary year to year, but usually included a bird watch and activities for kids, such as making bird feeders from recycled materials. In recent years, TI planted a bird garden, distributed description pamphlets to all employees that attended the celebration, and promoted Ride Share Programs. Educational programs, like the Earth Day celebration, have been and always will be an important part of TI-M&C dedicated service to the community, TI employees and the environment.

During the 1999 Earth Day ceremonies a mock check for $50,000 was presented to the Massachusetts Audubon Society. TI has pledged $10,000 a year, for the next five years, to the MAS Oak Knoll Sanctuary. The money will be used to further develop the Society's Oak Knoll Wildlife Sanctuary and Ottmar Nature Center in Attleboro.

TI's contributions to the MAS have enabled the Society to develop an educational program for Attleboro area children. This program emphasizes math, science, and environmental studies and the development of some environmental relationships. TI is supporting the development of quality nature programming to all Attleboro area residents.

Environmental Education

Hosted by the M&C ESH team through the Teacher Summer Residency Program, a team of five Attleboro educators spent time in June 1998 forging ties with members of the M&C ESH team. The experience resulted in a direct delivery of key environmental learning to students attending the local public schools. The team of educators included an elementary school teacher, a middle school teacher, two high school teachers, and an elementary school principal. During their stay, they learned a role playing technique that utilized a "systems approach" to complex problem solving in a simulated "Design For Environment (DFE)" activity, which they can replicate with their students. One past alumnus of the program incorporated principles directly from this program into a three week unit for his "Citizenship and Life Skills" course at the Attleboro High School.

Community Giving: United Way

The TI Attleboro/Mansfield site can boast a long history of supporting the United Way of New England with an annual campaign to encourage employee donations to the cause. In the Greater Attleboro & Taunton region, TI is one of the largest contributors. During the 1998 campaign for example, the site donated over $442K, of which $315K came directly from employee or retiree contributions and most of the remainder came from the TI Foundation and the TI Community Relations Fund. Employee participation was over 71%, with an average gift of $123 per employee. Such a participation rate constitutes near benchmark level performance in New England.

There are many elements of TI's annual campaign that fuel this type of exemplary performance, but one program that deserves special recognition is the Day-of-Caring project. TI has supported two day-of-caring projects each year for the past five years. These projects mobilize 50 to 60 employee volunteers from across the site to spend a full workday at a United Way member agency in the local area performing necessary improvement projects. TI M&C employees have renovated buildings, built an amphitheater, and cleared trails at a YMCA summer camp. They have renovated interior office spaces and exterior landscaping at an agency that provides aid to battered women. They have provided similar services to agencies that offer literacy training to immigrants and the uneducated. The ongoing relationship between TI and the community, through United Way activities, is a clear example of the dedication and commitment that not only TI, the company exhibits, but the commitment of TI employees and retires.

Awards & Recognition

The Attleboro and Mansfield sites of TI-M&C continue to be recognized as an Environmental Leader by the EPA's Region I Environmental Leadership Program (ELP). TI-M&C continues to participate in the StarTrack 3rd Party Certification Project, which is designed to privatize environmental compliance assurance and reduce the regulatory burden.

The Attleboro and Mansfield sites received a Bronze Award in recognition of their superior Environmental, Health, and Safety performance. The Bronze Award is the third level of award classification in the TI Environmental, Safety and Health Excellence Award program. This award, which began in 1994, is open to all TI sites worldwide.

The Attleboro site received the Massachusetts Safety Council, Group Safety Award for its excellent safety record during 1998.

StarTrack

Certification

- ***The Texas Instruments Incorporated, Materials and Controls division manufacturing facility in Attleboro has been acknowledged as an Environmental Leader under the EPA Region 1 Environmental Leadership Program (ELP). The EPA selects companies that demonstrate leadership to participate in projects that broadens the field of environmental protection. TI Attleboro is currently an active participant in the "StarTrack Third Party Certification Project" (StarTrack).***

The purpose of StarTrack is to develop a process by which an industrial company fulfills its environmental obligations to demonstrate compliance with minimal government involvement. In this way, some governmental resources could be redirected in a more meaningful and cost effective manner. StarTrack proposes, by employing an independent third party to review a company's procedures for assuring compliance and managing environmental issues that a company can be certified as having a sufficiently good environmental management system to warrant reduced regulatory supervision.

An independent third party has been retained by TI to observe our activities and render an opinion on the capability of the audit process to document compliance, and the Environmental Management System (EMS) to maintain compliance and promote going "beyond compliance" to champion activities such as Pollution Prevention and Design for Environment (DFE). The third party renders its opinions via a series of "Certification Reports", which follow. TI has retained Cahaly Environmental of Lexington, MA to act as its independent third party reviewer. In addition, TI has drafted this Environmental Progress Report in keeping with the criteria for StarTrack membership.

Being chosen, M&C for this program by the EPA, has distinguished TI Attleboro as an environmental leader. TI Attleboro's commitment to conduct environmentally safe activities not only benefits our employees but also the community around us. Participation and certification in this StarTrack program has strengthened TI's environmental policies and will serve to continually add value and success to TI M&C operations.

TI Attleboro Site Compliance History
1993-1997 Summary

	1994	1995	1996	1997	1997
Type of Audit	Corporate TI Internal	Corporate TI Internal	StarTrack 3rd Party	M&C Self-Audit	StarTrack 3rd Party
Protocol	TI Internal	TI Internal	TI Internal	TI Internal	TI Internal
Perceived Deficiency	None	None	1996 (a) 1996 (b) Below	None	1998 (a) 1998 (b) 1998 (c) 1998 (d) Below
Corrective Action	------	------	Below	------	Below

1998 StarTrack 3rd Party Audit Summary

1998 (a): In March the site exceeded the daily maximum value for cyanide (0.31 actual versus permit limit of 0.18 mg/l). This exceedence was reported in the monthly discharge monitoring report for the month of March. However, the EPA has written regulations that require 24-hour notification when a limit is exceeded. This 24 hour notification was not provided.
Corrective Action: At the time of the audit, site procedures for notifying the EPA of exceedences had been to include notification of the permit exceedence and summary of corrective actions in the site's monthly DMR report. These site procedures were developed based upon guidance provided by EPA-Region I. TI has relied on the adequacy of these notification procedures for permit exceedences.
Preventative Action: However, 40 CFR section 122.41 clearly indicates the need to notify the EPA within 24 hours of the site learning of an exceedence to a permit discharge limit. On October 31, 1998, procedures to ensure that appropriate and timely notification were established.

1998 (b): At the time of the audit, the site spill control plan PE stamp exceeded three years. Currently the spill control plan is being incorporated into an integrated contingency plan that should be completed in November 1998.
Corrective Action: Prior to the audit, the site instructed the contractor retained to develop the site's Integrated Contingency Plan (ICP) to contact EPA-Region I regarding the issue of the PE stamp. The Agency advised the contractor that the date at which re-certification is required is based on the last date that the SPCC had been updated (which was November 21, 1995). Consequently, the site had developed a program to update the SPCC prior to November 21, 1998 as an element of the program to produce the ICP and completed the update prior to this date.

Preventative Action: Since the crux of this audit issue was the site's inability to demonstrate when updates to the SPCC were performed, a revision table will be maintained in the updated ICP which will prevent this kind of confusion from occurring in the future.

1998 (c): The Mansfield site's copy of the Storm Water Pollution Prevention Plan was reviewed and the document indicated that the necessary site storm water assessment had been completed in '97, '95, and '93. The assessment is required as an annual assessment. The site does perform twice per month inspections to minimize actual contamination and there may have been documentation available at other locations, which documented these annual inspections, had been done at the Mansfield site. If the annual assessments have been done or if the twice-monthly inspections do cover all elements required, then the Mansfield plan need only be updated. (60 FR 51125 Part XI)
Corrective Action: Annual site inspections are conducted at the Mansfield site in accordance with the requirements of a General Stormwater permit and most recently in accordance with a Multi-Sector Stormwater permit. Though the documentation exists, it was not available at the time of the audit in the on-site copy of the stormwater permit. Immediate corrective action will consist of ensuring that this documentation is available during future reviews of this document.
Preventative Action: Results of weekly inspections will be documented in the Mansfield Storm Water Pollution Prevention Plan and will fulfill the requirements of annual site inspections.

1998 (d): The site operates several cleaning units subject to the Solvent Cleaner NESHAP. A review of documents indicate that the Initial Statement of Compliance was not submitted to EPA, Region I on the May 1, 1998 due date. This notification was completed, but retained in the air quality records rather than being submitted to the regulating authority. (40 CFR Part 63, Subpart T). NOTE: This perceived regulatory deficiency was uncovered during a quarterly corrective action plan update and not during the September 1998 audit.
Corrective Action: Initial Statement of Compliance submitted to the EPA on February 26, 1999.
Preventative Action: Significant confusion exists around the timing of recordkeeping relating to NESHAP, MACT and related standards (the recordkeeping requirements are in 40 CFR Part 63, Subpart A and the performance requirements are in other Subparts). A consulting firm expert in these regulations has been retained to conduct a review of TI operations to ensure that all past reporting requirements have been met and that the site compliance schedule contains notes on when future reporting requirements are due.

1996 StarTrack 3rd Party Audit Summary

1996 (a): Documentation of RCRA training provided during audit showed periods of up to 24 months without refresher training for several persons who perform duties involving handling hazardous waste.
Corrective Action: Chemical Control initiated a refresher training program, which was successfully completed by 1Q97.
Preventative Action: RCRA badge training and expiration program setup, so that all employees who require RCRA training receive a badge with expiration date.

1996 (b): As noted in TI's Title V Operating permit application to the Massachusetts DEP, a conveyorized cleaner used to clean and lubricate strips of metal (EU 24 RSL) operates at speeds greater than the 11 ft/min specified in 310 CMR 7.18(8)a pertaining to cold solvent cleaners.
Corrective Action: Upon discussion with the Massachusetts DEP, the RSL operation was determined to be in compliance as an unclassified miscellaneous VOC source. Because the operation looks like a cold cleaner, TI has decided to submit a permit classifying the operation as an "applicator". The DEP concurs with this as the most appropriate action to resolve this issue and issued a permit in March 1999.

The Goal of a Gap Analysis

No	Gap	Status
1	Define TI ESH policies and principles.	Complete 2/98
2	Better advertise SP&P 4-4-21.	Ongoing
3	Need to perform compliance audits and selected management system audits.	Ongoing
4	Master document that lists each existing piece of abatement equipment currently in use.	Ongoing
5	**Formalize ESH Tools in New Product Development.**	Complete 5/99
6	Create a written 2-phase protocol for identifying environmental aspects.	Complete 11/98
7	Create a legal and related obligations procedure and associated calendar.	Complete 1/98
8	Incorporate ISO14001 elements into Policy Deployment process.	Complete 1/98
9	Documentation on roles, responsibilities, and authorities.	Ongoing
10	A master document for training requirements of specific individuals.	Ongoing part of DPM program.
11	A focused internal, external communication program should be designed and executed.	Ongoing
12	Documentation needs to be prepared which describes the core elements of the EMS.	Complete 1/99
13	Protocol establishment for locating, reviewing, approving, obsoleting, and retaining documentation.	Ongoing
14	Identify in writing all site operations and activities for which this existing protocol discloses “significant aspects”.	Ongoing
15	**Complete Integrated Contingency Plan.**	Ongoing
16	Monitoring and measuring those operational characteristics identified as having significant potential impact.	Ongoing
17	Procedure for identifying responsibilities relative to handling of EMS non-conformance.	Ongoing
18	Procedure for identifying, maintaining, retrieving, and disposing of all records of an environmental nature.	Ongoing
19	EMS 2-phased approach, a gap closure plan should be monitored on a regular, quarterly basis by an EMS audit team.	Ongoing
20	After reaching conformance with the EMS standard, there should be a documented management review of EMS performance.	On hold until conformance achieved.

EMS Status Statement

TI is striving to bring its management system into conformance with the requirements of the ISO 14001 standard and to utilize the many opportunities available to assess our status. In addition to the Star Track EMS assessment performed in the first year of our involvement with Star Track, TI participated in an EMS benchmarking study conducted by Stanley Works. These two assessments were the basis of the gap assessment in the previous section. Since these assessments, TI has had its EMS evaluated by a number of customers performing management system reviews as part of QS9000 audits and general customer audits. Based on this review of our management systems, we can say that, while not yet demonstrating the implementation level required by ISO 14001, we have reached or exceeded a majority of the requirements. For example, TI's objectives and targets are consistent with the environmental policy requirement of ISO 14001, including a strong commitment that exceeds standards and specifications in regards to prevention of pollution, "TI's program in minimization of waste has been deemed best of class".

While we continue to work to enhance and tailor our management systems for complete ISO 14001 conformance, we are continuing to focus on improving environmental performance and supporting our businesses by providing value. Our goal is to be in full conformance with ISO 14001 in the next two years followed by eventual certification.

Michael J. Elliott
Environmental Manager

Francis J. Veale
EHS Manager

Final Thoughts

It has been our pleasure to present this 1998 Annual Report on the Environment to you: *our collegues, the reglatory agencies, and, especially, to our business customers and the general public.*

We truly hope that you have found this report both informative and innovative. This report is being offered on both CD-ROM media and on our new external web site. These publishing methods eliminates the need for the use of toxic inks and reems of paper, while providing a more cost effficient method of producing and distributing this report.

As was mentioned in the Welcoming message, please feel free to contact the ESH department about this report or any other aspect of ESH at Texas Instruments. As always, we look forward to hearing your thoughts and comments.

Regards,

Michael Miller
Environmental Specalist, Special Projects Facilitator

Ray Lizotte
Senior Environmental Engineer, Manufacturing Liaison Manager,
Member TI Technical Staff