

Implementation of an Integrated Safety, Health, Environment, and Quality Management System

ZOCHEM

Division of Hudson Bay Mining and Smelting Co. Limited





OVERVIEW OF PRESENTATION

- COMPANY BACKGROUND
- OVERVIEW OF INTEGRATED MANAGEMENT SYSTEM
- SYSTEM PROCESSES
- ACHIEVEMENTS
- KEY SUCCESS FACTORS





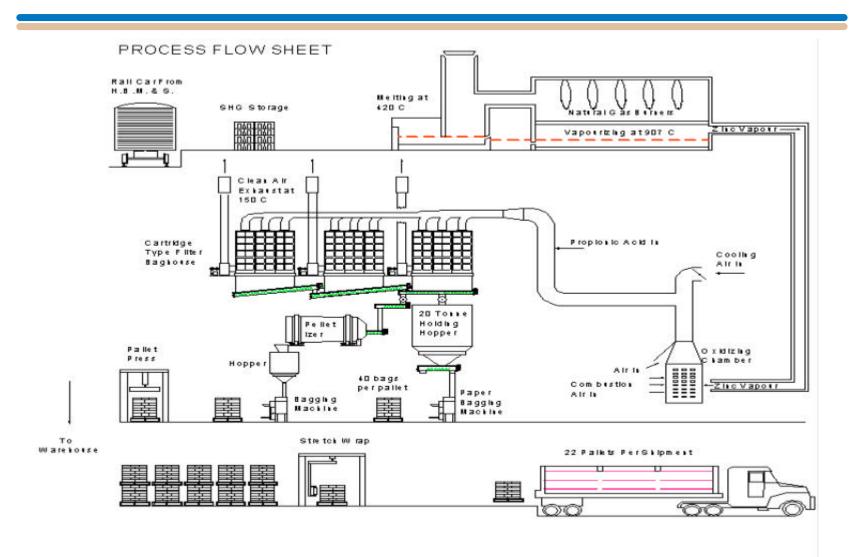
COMPANY BACKGROUND

- Zinc oxide manufacturer
- Division of Hudson Bay Mining and Smelting Company Ltd.
- Largest single site producer in North America
- Located in Brampton, ON
- 40 employees
- > 40, 000 MT / year





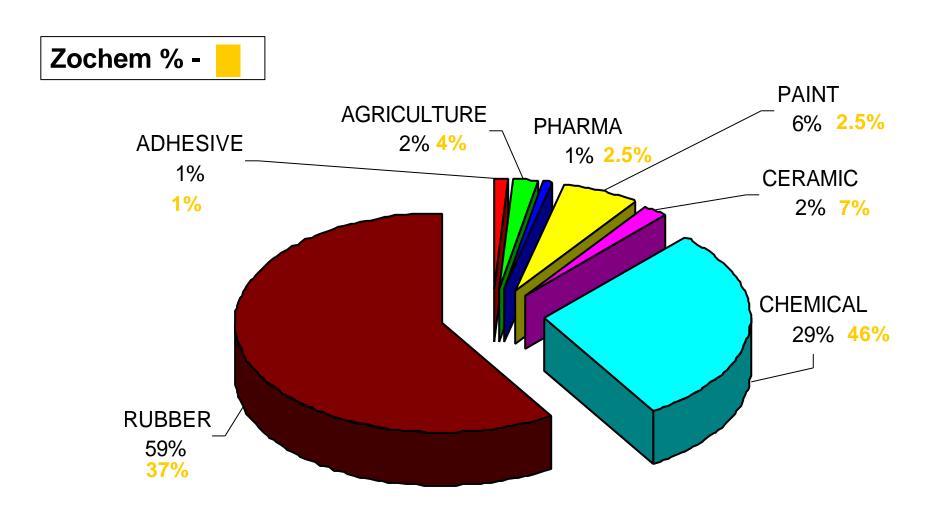
SCHEMATIC OF A PRODUCTION LINE







NORTH AMERICAN ZINC OXIDE CONSUMPTION







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INTEGRATED MANAGEMENT SYSTEM

- ISO 9001:2000 (Quality Management System)
- ISO 14001:1996 (Environmental Management System)
- OHSAS 18001:1999 (Occupational Health and Safety Management System)

Scope of registration:

- facility wide





PATH TO INTEGRATED MANAGEMENT SYSTEM

Spring 2002: Set objective to achieve registration to <u>ISO 14001</u> and upgrade to <u>ISO 9001:2000</u> by the end of 2003.

Hurdle: Turn existing management system from "paper chase" to "value added management system"

	From →	То	Hurdles
Aug. 2003	ISO 9002 (since 1997)	Upgrade to ISO 9001:2000	Additional requirements / documentation process vs. elemental audits
Nov. 2003	No environmental management system	ISO 14001:1996 implementation - no non-conformance in the registration audit	 Additional requirements / documentation Integrating with existing ISO 9001 Management involvement Auditing new system
Sept. 2004	OHSAS 18001 built into ISO 14001 system	OHSAS 18001:2000 implementation – no major nonconformance in the registration audit	 Fine tune requirements / documentation Integrating with existing ISO 14001 and ISO 9001
Mar. 2005		1st integrated internal audit	Ensuring all clauses are covered
Apr. 2005		1st integrated external audit	





OVERVIEW OF INTEGRATED MANAGEMENT SYSTEM

- Three tier system
 - ✓ Tier I policy
 - ✓ Tier II procedures and work instructions
 - ✓ Tier III forms and records
- Risk based approach
 - ✓ Safety
 - ✓ Health
 - ✓ Environment, and
 - ✓ Quality
- Integrated policy, objectives and targets, internal audits, external audits, management reviews for quality, safety & health and the environmental management system



SAFETY, HEALTH, ENVIRONMENT AND QUALITY POLICY

Zochem is a production and distribution facility that produces zinc oxide. Our product is sold worldwide, with the majority of sales being within North America. We are committed to the supply of high quality product that is manufactured in a safe and environmentally responsible manner.

In pursuit of this policy, Zochem maintains systems that meet the requirements of ISO 9001, ISO 14001 and OHSAS 18001. These systems encompass the following principles:

COMPLIANCE

Zochem is committed to meeting its responsibilities through compliance with all customer and corporate requirements, as well as applicable environmental, and safety and health legislation.

PREVENTION

By monitoring key performance indicators and customer satisfaction, Zochem is able to identify and rectify negative trends. Our commitment to a safe and healthy workplace is achieved through engineered solutions, personal protective equipment (PPE), and standards/procedures. Zochem strives to operate in a manner that minimizes any adverse effect of its operations on the community and the environment. This is achieved through pollution prevention, energy conservation, and waste minimization.

These activities are the responsibility of every employee and are supported by training whenever appropriate. Employees are encouraged to report activities that could have a negative impact on quality, the environment and/or health and safety.

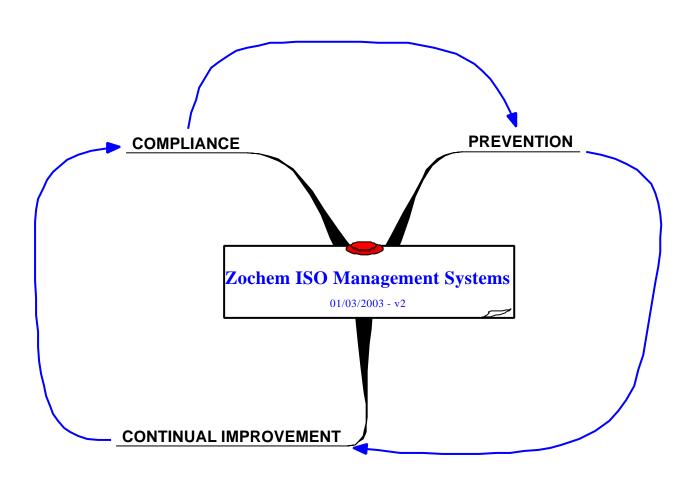
CONTINUAL IMPROVEMENT

To ensure continual improvement within all systems, matters of significance are considered when setting annual objectives. As part of this process, we assess and prioritize hazards and risks and review this policy and objectives regularly.

This policy is communicated to all employees and contractors and is also available to the public.









PROCESSES

SIX MAIN PROCESSES

- PRODUCTION PLANNING
- SHIPPING / RECEIVING / WAREHOUSING
- PRODUCTION
- MAINTENANCE & UTILITIES
- FINAL INSPECTION & TESTING
- MANAGEMENT SYSTEMS





OPERATIONAL CONTROL

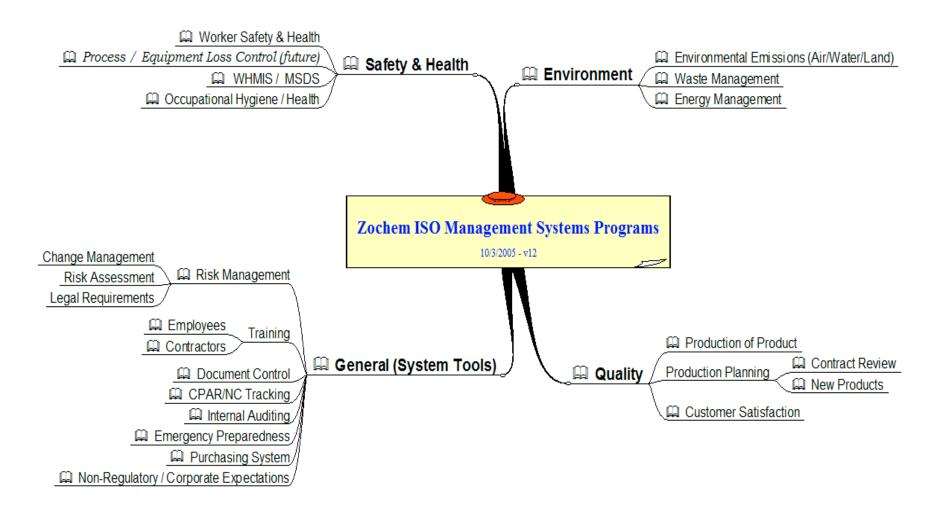
(OVERVIEW)

PRODUCTION PLANNING	RECEIVING (VIA RAIL CAR / TRUCK)	METAL STORAGE	FURNACE A	FURNACE B	FURNACE C	BAGHOUSE FLOOR	HOPPER TOP	BAGGING	WAREHOUSING & SHIPPING (VIA TRUCK)
Marketing Quotations Order entry	UNLOAD METAL	STORE METAL	FEED METAL -	VAPORIZE	OXIDIZE	SEPARATE OXIDE/ AIR	IN PROCESS - INSPECTION & TESTING	BAG / REPACK PRODUCT	PREPARE, STORE & SHIP PRODUCT
A C	TIVITIES			ACTIV	TIES			ACTIV	ITIES
Secure zinc metal packaging materials Review, confirm and or change orders Maintain customer profiles (FoxPro)	Inspect / put required nlo on metal blocks (identification) 2. Unload from rails cars / trucks	Batch & stack incoming metal Process zedoc/candle Store metal-Koting bags Store refractory	Assign batch to furnace Load metal to furnace per assigned batch (Lab) Maintain furnace level Skim metal	Clean vapor ports Drain lines	Grade changes Vapor port and C-box clean out	Baghouse(BH) monitoring BH stack emissions Transfer acid drums Start / stop acid pumps	Check screenS & magnets Collect samples Test samole (Saniors' lab) Operate palletizer	1.Check scales 2. Bag product 3. Collect samoles (fwd to CC lab) 4. Stamp bags 5. Operate compactor	Prep product / stretch wrap Load product for customer Load orod, for ext. warehouse Warehouse product internally Batching WI - need to develop SOP
	PROCEDURES AND FORMS PROCEDURES AND FORMS								
Contract review WI WI - 212	1. Shipping	I							
2. Inventory by grades Report - 3. Customer profiles 4. Quality assurance material grade specification - 5. Customer waiver WI - 089 5. Data entry bagging sheets - 337 7. Updating profiles WI - 213 3. Production plan-309	receiving WI-114 2. High Grade Analysis-076 3. QA material grade Spec-223 4. Approved Vendor List WI-420 5. Receiving Zn metal WI-555 Forms 1. CN Trains unloading form - 207 7. Shift checklist fused through out plant) - 265	Shipping receiving WI-114 Forms Metal Koting Shipping form-094	2. Operating slab loader - 143 3. Authorized furnace level - 177 4. Scrap Metals Jumbo SOP - 403 5. Furnace startup work instruction-389 Forms 1. Furnace control sheet - 100 2. Scrap Metal weight sheet - 405	3. Vapour Port SOP - 404 Forms 1. Furnace Cntrl sheet - 100 2. Vapour Port cleaning Schedule - 398	ine Inspection and furnace maint 3. Grade change 8 Particle Size Control - 130 4. Scrap metal jumbo SOP-403 Forms 1. Furnace Critri sheet - 100 2. Grade Change Forms (F1-F6) 524 & 362-366 3. Scrap metal weight sheet-405	3. Baghouse Operational Controls - 488 Forms 1. Main fan line reports - 116		2. Use 2192lbs Check Weight - 109 3. Bagging WI - 144 4. Authorized bulk Bag Tag colors-206 5. P3 - compactor WI - 263 6. Bulk Bag - 264 Forms 1. Temporary Bagging Form-056 2. Daily Operational data - 086 3. Pelletizer control form - 092 4. Metal Koting prod.	2. Shipping receiving WI - 114 3. Authorized Load Patterns-104 4. Return Goods Flow chart-179 5. Allozate Inventory / print pallet release sheets - 307 6. Printing shipping doss - 308 7. Shirink wrap machine WI-475 8. Printing shipping doss - 308 7. Shirink wrap machine WI-475 9. Control of NC product - 458 10. Customer waiver WI - 089 Forms 1. Metal Kotting shipping form-190 2. Double pallets form - 186
Report 3. Custome profiles 4. Quality assurance material grade specification 5. Customer waiver WI - 089 5. Data entry bagging sheets - 337 7. Updating profiles WI - 213 6. Production plan-309	2. High Grade Analysis-076 3. OA material grade Spec-223 4. Approved Vendor List Wi-420 Wi-420 5. Receiving Zn metal Wi-555 Forms 1. CN Trains unloading form - 207 2. Shift checklist used through	Forms 1. Metal Koting Shipping form-094	Operating slab toader - 143 A suthorized furnace level - 177 Scrap Metals Jumbo SOP - 403 Furnace startup work instruction-389 Forms 1. Furnace control sheet - 100 2. Scrap Metal weight sheet - 405	3. Vapour Port SOP - 404 Forms 1. Furnace Cntrl sheet - 100 2. Vapour Port	3. Grade change 8. Particle Size Control - 130 4. Scrap metal jumbo SOP-403 Forms 1. Furnace Cntrl sheet - 100 2.Grade Change Forms (F1-F6) 524 & 362-366 3. Scrap metal weight sheet-405	anance, 216 ===================================	3. Senior lab testing - 533 Forms 1. Magnet Cleaning Schedule - 520 2. Furnace sample - 477 3. Furnace sample weekend App-519	2. Use 2192lbs Check Weight + 109 3. Bagging WI + 144 4. Authorized bulk Bag Tag colors 206 5. P.3 - compactor WI - 263 6. Bulk Bag - 264 Forms 1. Temporary Bagging Form-056 2. Daily Operational data - 086 3. Pelletizer control form - 092 4. Metal Koting prod.	Shipping recaiving WI - 114 A ulthorized Load Patterns-104 Return Goods Flow chart-179 Allocate Inventory / print pallet release sheets - 307 Frinting shipping docs 308 Frinting shipping docs 308 Printing shipping docs 308 Printing shipping docs 308 Printing shipping docs 308 Printing shipping via VI - 255 D. Control of NC product - 458 Octoor of NC product - 459 Control of NC product - 459 Control of NC product - 459 Mac - 45





SHEQ "Program" Leaders







"Program" Leaders

Generic Roles and Responsibilities

- Understand and anticipate requirements
- Communicate changing requirements
- Go-to for external and internal audits
- Ensure effective and efficient operation of program/process
- Suggest changes to management system, work instructions etc. when appropriate
- Address non-conformances and corrective, preventive actions
- Create non-conformances and corrective, preventive actions when appropriate
- Maintain awareness of KPIs affecting process
- Make recommendations regarding training requirements

All "programs" are reviewed annually during Management Review Meetings





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- COMPANY BACKGROUND
- OVERVIEW OF INTEGRATED MANAGEMENT SYSTEM
- SYSTEM PROCESSES
 - RISK ASSESSMENT
 - OBJECTIVES & TARGETS
 - CHANGE MANAGEMENT
 - DOCUMENT CONTROL
 - TRAINING
 - CPAR & Non-conformance
 - AUDITS
 - MANAGEMENT REVIEW
- ACHIEVEMENTS
- KEY SUCCESS FACTORS





RISK ASSESSMENT PROCESS

Severity x Probability = Exposure

Steps:

- Business Activity or Process
- Specific Equipment / Task (When you do this activity)
- Hazard / Aspect Description (As this happens)
- Business Risk or Impact (This could result)

Considerations:

- Involvement of contractors, employees or both?
- Legal and other requirements?
- Normal or abnormal situations?

Outcome:

- Significant or not significant risk
- Operational control required for significant risks
 - Objectives
 - Procedures
 - Monitoring and measurement activities





APPLICATION OF RISK ASSESSMENT PROCESS

- INCIDENTS AND ACCIDENTS
- CORRECTIVE / PREVENTIVE ACTIONS
- CHANGE MANAGEMENT

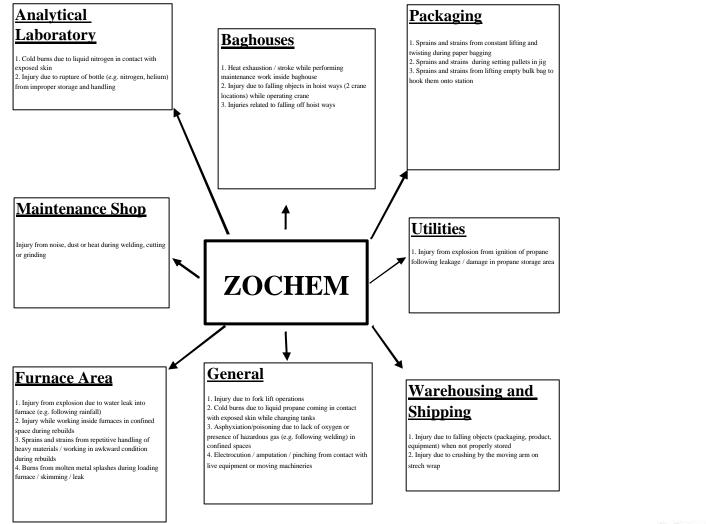
Risks are reviewed by

- Joint health and safety committee monthly (new ones only)
- Management review committee quarterly (new ones only)
- Employees annually (applicable risks)
- Management annually (all risks)





SAFETY & HEALTH HAZARDS, ENVIRONMENTAL ASPECTS AND QUALITY RISK DIAGRAM







OBJECTIVES AND TARGETS

- Integrated objectives are set within each category:
 - compliance
 - prevention and
 - continual improvement
- Formally reviewed every quarter
- Change management process used
- Monitored by key performance indicator where applicable





CHANGE MANAGEMENT

Integrated change management system

- Safety and health
- Environmental
- Quality
- Business

Program leader manages this program

Key elements reviewed for each project

- Hazards, aspects & impacts and risks
- Procedural changes
- Emergency preparedness plan
- Training needs
- Legal requirements
- Validation requirements
- "Pre-start safety review" requirement
- "Notice of project" requirement
- Customer notification requirements





DOCUMENT CONTROL

- Management system documents are available in electronic format only (with the exception of posted documents)
- Electronic approval system
- Most records are maintained electronically
- Program managed by "document control" program leader





TRAINING

- Training data base used for maintaining training information
- E-mail alerts are automatically sent when training updates are needed
- "Absolutes" in most procedures
- Program managed by "training" program leader





CPAR & NC SYSTEMS

<u>CPAR</u> (corrective/preventive action report)

- Includes such things as major customer complaints, medical aids or loss time injuries, incidents resulting in significant risk classification and non-conformance trends
- Maintained electronically
- Updated by supervisors and managers responsible
- Managed by program leader
- Accessible by all employees
- Discussed formally at weekly / monthly meetings

NC (non-conformance)

- Separate from the CPAR system but with same features
- Used mainly to collect data
- Basis for trend analysis / KPI
- Incident / accident reports are tracked in NC log
- Triggers CPAR or Objective for Continual Improvement where needed





INTERNAL AUDIT PROGRAM

- Follows ISO 19011 guidelines
- Audit program leader (separate from the IMS Coordinator) manages the audit program
- 12 internal auditors
- 3 lead auditors
- All processes are audited at least once a year.
- Also various program leader responsibilities audited





EXTERNAL AUDITS

- Twice yearly "Continuing Assessment" audits by Registrar
- Customer audits
- Supplier audits
- SHE Compliance audits
- Other audits (e.g. IAPA Audit)





MANAGEMENT REVIEW

Agenda Topics:

- Policy
- Objectives and targets
- Audits
- Corrective and Preventive actions (CPAR)
- Key performance Indicators (KPI) review & Process performance
- Program leader updates
- Hazard identification and risk assessment processes
- Change management
- Recommendations for improvement / updates
- Review Supplier Performance Evaluation Report
- Summary of regulatory review
- External visitations and communications
- Review JHSC recommendations
- Follow up actions from previous management reviews



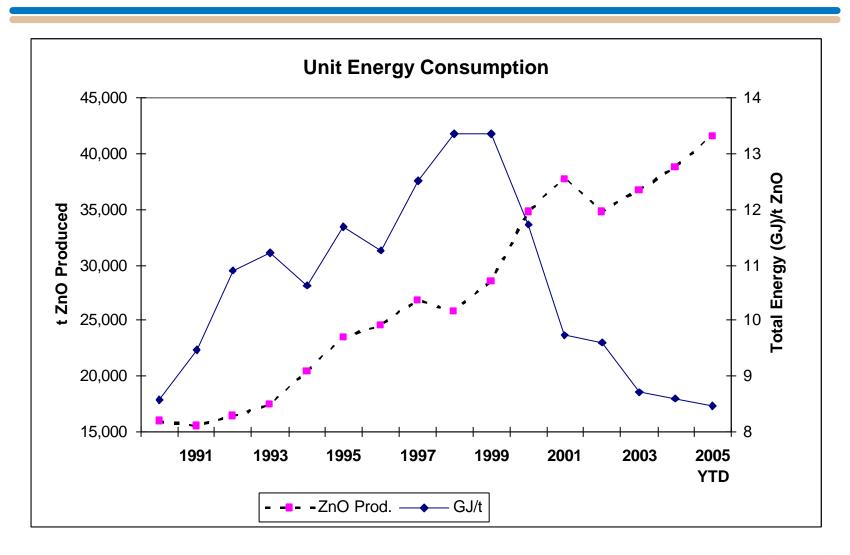


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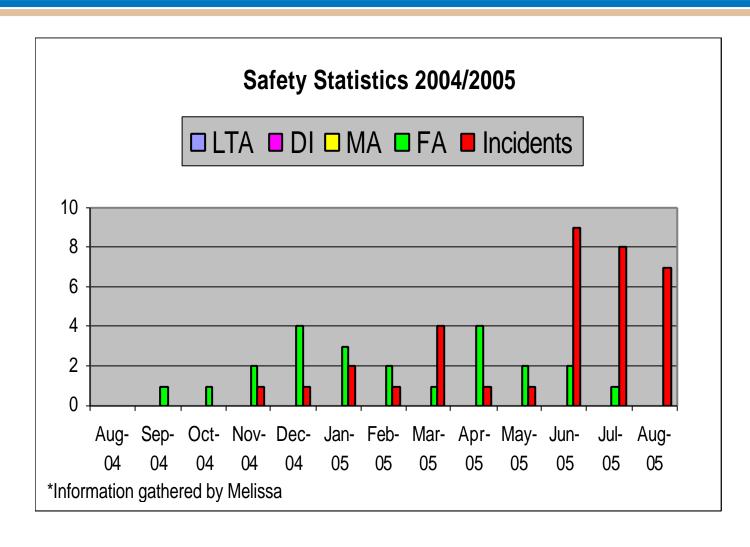
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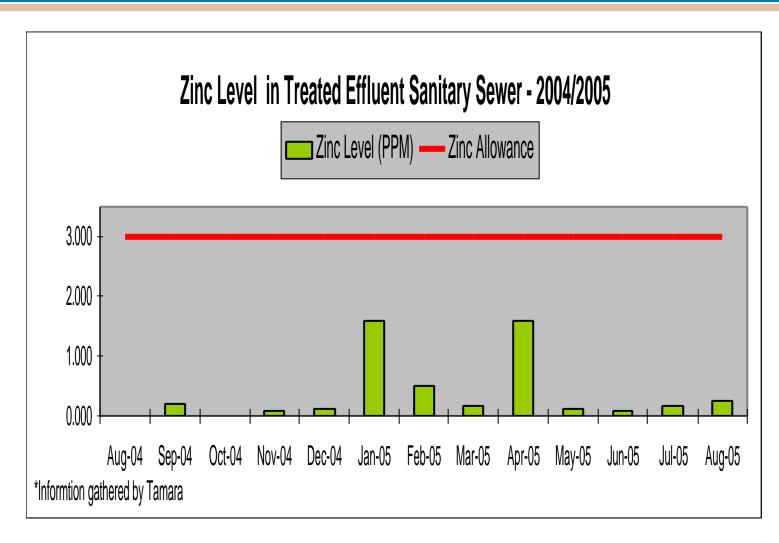




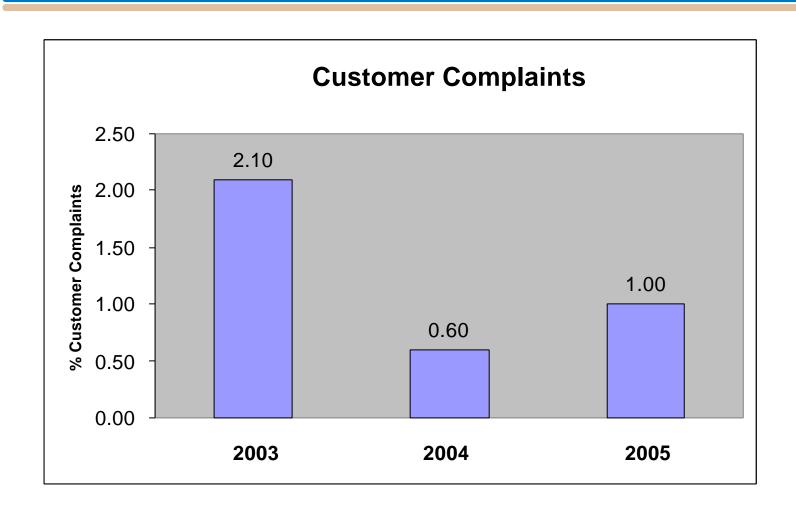




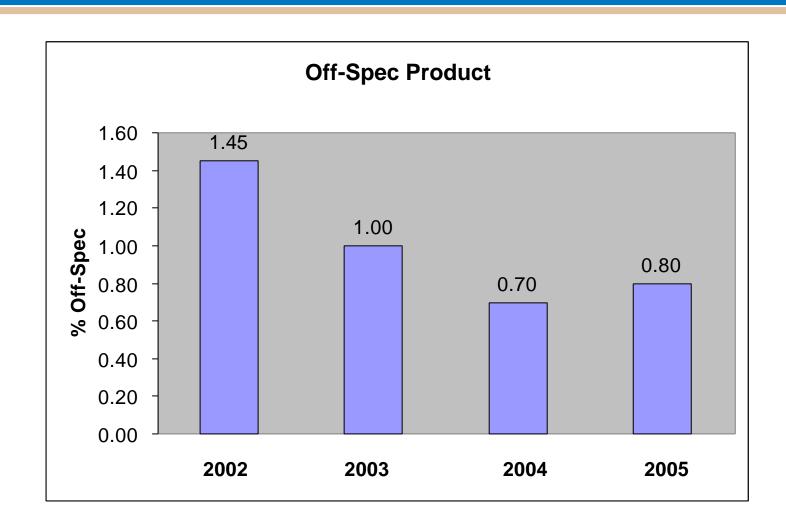










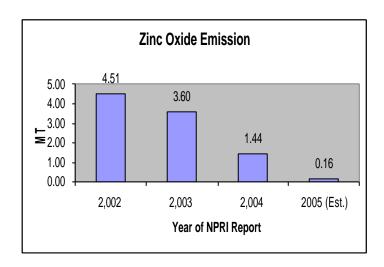




ACHIEVEMENTS (Others)

- Recipient of IAPA Health & Safety Award (Level 1)
- Property clean up (pond & septic tank removal)
- Others (water, noise etc.)

Reduction in zinc oxide emission reported to NPRI







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KEY SUCCESS FACTORS

- Appropriate resources in place
- Strong internal audit program
- Active Management team involvement
- Program leader concept
- Strong NC / CPAR system
- Change management system
- IMS Coordinator





Questions?

