SUMMARY OF EO CENTER PSM AUDIT
CONDUCTED DURING OCTOBER, 1991

MAJOR STRENGTHS

KNOWLEDGEABLE LINE, TECHNICAL, AND WAGE ROLL EMPLOYEES THAT DEMONSTRATE A HEALTHY RESPECT FOR THE HAZARDS INVOLVED WITH THE EO CENTER OPERATIONS.

USE OF PLC'S TO ELIMINATE HUMAN ERROR DURING OPERATION OF EO REACTORS.

OPERATORS FORMALLY INVOLVED IN OI REVIEWS AS PART OF ISO-9000 CERTIFICATION EFFORT. OI'S AND PROCEDURES WERE IN VERY GOOD SHAPE.

SELECTION AND CONTROL OF CONTRACTORS.

ONGOING EFFORT TO UPGRADE AREA DOCUMENTATION, PARTICULARLY GENERATION OF DETAILED EQUIPMENT AND INSTRUMENTATION DESCRIPTIONS.

AREAS FOR IMPROVEMENT

ELIMINATION OF CRITICAL PIPING AND ELECTRICAL DEVICES THAT DO NOT MEET EXISTING CODES.

DEVELOPMENT/UPGRADE OF PROCEDURES DEALING WITH COMPLETE UTILITIES LOSS AND E&D SITUATIONS.

IMPROVE CONDITION OF EXISTING GROUNDING DEVICES AND CONTROL PANEL INDICATOR LIGHTS AND ALARMS.

QUALIFICATION AND TRAINING OF OPERATORS, MECHANICS, AND THEIR SUPERVISORS (APPLIES TO ENTIRE PLANT SITE).

DEVELOPMENT OF A PROCEDURE FOR TRACKING OF OPEN PHR RECOMMENDATIONS VS. RELIANCE ON EXPERIENCE (APPLIES TO ENTIRE BUSINESS UNIT).

COMPLETENESS, PROPRIETORSHIP OF EQUIPMENT FILES AND EQUIPMENT MAINTENANCE HISTORY (APPLIES TO ENTIRE UNIT).

PROCEDURES/MECHANISMS FOR EVALUATING EQUIPMENT AND VESSEL INSPECTION/TEST DATA (APPLIES TO UNIT).

MORE FREQUENT UPDATING OF BUILDING CHEMICAL HAZARD LIST (APPLIES TO UNIT).

EMERGENCY RESPONSE DRILLS AND TESTING OF EVACUATION ALARMS NEED TO BE UPGRADED (FREQUENCY AND/OR DOCUMENTATION).

COMMENTS

A NUMBER OF PROGRAMS ARE UNDER WAY OR UNDER CONSIDERATION FOR BUILDING UPGRADE. EXISTING DEFICIENCIES EMPHASIZE THAT UPGRADE SHOULD CONTINUE TO BE A PRIORITY.

- WEST WALL IS FAILING.
- SOME SECTIONS OF EO PIPING DO NOT MEET PIPE CODE AND WERE NOT INCLUDED IN "THICKNESS CHECKS".
- ELECTRICAL FIXTURES THAT DO NOT MEET THE ELECTRICAL CLASSIFICATION GUIDELINES.
- INADEQUATE SPRINKLER PROTECTION AND WATER SUPPLY CONCERNS.
- EXIT DEFICIENCIES.

IT'S DIFFICULT TO DRAW CONCLUSIONS BASED ON A "FEW" FIELD OBSERVATIONS. HOWEVER, THE AREA SHOULD FOLLOW-UP TO INSURE THAT THERE IS AN UNDERSTANDING OF "SAFETY" PRECAUTIONS VS. A "BY THE NUMBERS" APPROACH.

- ALARM LIGHTS TESTED BUT DEFICIENCIES WERE NOT CORRECTED.
- BROKEN (THROUGH) GROUND WIRE IN USE AT FLAMMABLE LOADING/UNLOADING SPOT.
- EO RAIL CAR GROUND ALARM NOT FUNCTIONING PROPERLY.

RECOMMENDATIONS

FOR THE CHAMBERS WORKS SITE...

DEVELOP GUIDELINES FOR DEALING WITH CHANGES TO OI'S THAT OCCUR DURING START-UP ON TA.

DEVELOP PROGRAM TO PROVIDE ROUTINE INSPECTION OF GROUND WIRES.

DEVELOP GUIDELINES FOR ADDRESSING TRAINING OF NEWLY ASSIGNED SUPERVISION.

CHANGE START DATE FOR ONE YEAR LIMIT ON PHR CLOSURE TO DATE STATUS REPORT ISSUED (VS. DATE PHR NUMBER REQUESTED), OR INSTRUCT PHR CHAIRPERSON TO REQUEST NUMBER JUST PRIOR TO ISSUANCE OF STATUS REPORT.

NEED BETTER EDUCATION AROUND AVAILABILITY OF DECISION TREE FOR DETERMINING APPROACH TO PHR. CURRENTLY RELY VERY HEAVILY ON EXPERIENCE.

FOR PERFORMANCE PRODUCTS (INCLUDING THE EO CENTER)...

INCLUDE UPDATE OF AREA CHEMICAL HAZARD LIST IMMEDIATELY (VS. ANNUALLY) WHEN A NEW MATERIAL IS ADDED TO AREA.

DEVELOP TRACKING SYSTEM FOR OPEN RECOMMENDATIONS ON PHR'S. CURRENTLY, MANY LOW PRIORITY ITEMS "MASK" PRIORITY OF POTENTIALLY SIGNIFICANT ITEMS REQUIRING IMMEDIATE ATTENTION.

UPGRADE BUILDING E&D MANUALS TO INCLUDE CURRENT PHONE NUMBERS, LOCATION OF PULL STATIONS FOR DELUGE SYSTEM, EMERGENCY SHUT DOWN PROCEDURES, ALARM TEST FREQUENCY, AND BUILDING EVACUATION ROUTES.

PROVIDE ADDITIONAL TRAINING IN PHR METHODOLOGY FOR PHR CHAIRPERSONS.

NEED A BETTER UNDERSTANDING OF THE WHY AND WHAT FOR EQUIPMENT FILES (PUMPS, PVIS, VESSELS, TANKS).

FOR THE EO CENTER....

BRING FREQUENCY OF EMERGENCY DRILLS INTO COMPLIANCE.

DEVELOP BUILDING "EMERGENCY SHUTDOWN" PROCEDURE DETAILING HAZARDS BY PRODUCT IN THE EVENT OF THE LOSS OF VARIOUS/ALL UTILITIES.

DEVELOP CATASTROPHIC FAILURE PROTECTION IN SO2 HANDLING SYSTEM SIMILAR TO THE ONE IN PLACE FOR EO (XS FLOW VALVES).

INSTALL BARRICADING AROUND WEST WALL TO LIMIT HAZARDS FROM FALLING BRICKS WHILE PIPE SUPPORTS ARE BEING RELOCATED PRIOR TO WALL DISMANTLEMENT.

COMMUNICATE INSPECTION REQUIREMENTS ON FIRE DOORS AND FIRE EXTINGUISHERS. ALSO SUGGEST ROTATING RESPONSIBILITY OF EMERGENCY/SAFETY EQUIPMENT CHECKS (SAFETY SHOWER, FIRE EXTINGUISHERS, ETC.) TO INCREASE AWARENESS OF LOCATIONS AND FUNCTION.

EXPAND INVOLVEMENT OF WAGE ROLL EMPLOYEES IN PHR PROCEEDINGS.

DEVELOP TEST PROGRAM FOR "FEEDING EO" WARNING LIGHT OUTSIDE REACTOR ROOM, OR CONSIDER ALTERNATE APPROACH TO WARNING/COMMUNICATION SYSTEM THAT WILL ELIMINATE THE WARNING LIGHT ALTOGETHER.

DEVELOP PROCEDURE/PROGRAM TO ADDRESS INOPERATIVE PANEL LIGHTS IN BOTH EO REACTOR CONTROL ROOM AND PET ADDITIVES REACTOR PANELS.

TEST BUILDING VENTILATION SYSTEM VS. DESIGN CAPACITY TO ENSURE ADEQUATE DILUTION OF EO IN THE EVENT OF LEAKS.

ADD STATEMENT TO VARIOUS EO ADDUCTS OI'S TO EXPLAIN HAZARD ASSOCIATED WITH REACTOR NITROGEN PRESSURE BELOW 9 PSIG.

ADD STATEMENT TO OI'S REQUESTING LABEL CHECK ON INCOMING SO2 CYLINDERS.

GENERAL

HAZARDOUS CHEMICALS IN USE IN EO CENTER:

-SO2 IN TONS. TRANSFERRED USING VAPOR PRESSURE INTO BRINE-COOLED WEIGH TANK.

- ETHYLENE OXIDE (EO) FROM RAIL CARS. EMBRYOTOXIN, TERATOGEN, FLAMMABLE.

- SODIUM HYDRIDE. VIOLENT RXN WITH MOISTURE (SAME AS ELEMENTAL NA)

- LUBRIZOL 11 - TERT BUTYL PEROXIDE WHICH AUTODECOMPOSES >40C.

- FLAMMABLE SOLVENTS: TOLUENE, XYLENE

EO CENTER CONSISTS OF 6 PROCESSES WHICH YIELD APPROX. 70 PRODUCTS. MOST OF HAZARDS INVOLVE HANDLING OF RAW MATERIALS RATHER THAN RXNS OR FINISHED PRODUCTS.

2 MAJOR INCIDENTS IN RECENT PAST:

EXPLOSION IN RE-2 IN '89 DURING MFG OF THP 20EO. RXN MASS WAS STILL IN FLAMMABLE REGION DUE TO INADEQUATE PURGING. N2 PRESSURE RAISED FROM 3PSIG TO 9 PSIG TO AVOID REPEAT. SAME PROBLEM MAY HAVE RESULTED IN "BLACK" CHARGES OF PDG-15.

APPROX 10 LBS OF TOLUENE DISCHARGED FROM CAUSTIC SCRUBBER INTO DITCH WHILE WELDING WAS GOING ON. SPARKS IGNITED TOLUENE. TOLUENE PRESENCE UNDETECTABLE EXCEPT IF MEASUREMENT TAKEN DIRECTLY OVER DITCH. SCRUBBER CONTENTS NOW DISCHARGED TO T/T FOR DIRECT DISCHARGE TO WWTP.

ALSO A VICTIM OF A "NEAR MISS" WHEN TANK LID FROM OV EXPLOSION ROLLED PAST LOADED EO RAILCARS.

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QUESTION REVIEW NOTES

I. PROCESS TECHNOLOGY

HAZARDS OF MATERIALS

HAZARD INFO OF MSDS SUMMARIZED IN OI'S, WHICH ARE THE MAIN SOURCE OF HAZARD INFO FOR THE OPERATORS. HAZARD INFO ALSO APPEARS IN AREA CHEMICAL LIST (SPILL CONTROL PROCEDURE), BUT UPDATES REFLECTING THE ADDITION OF NEW MATERIALS TO AREAS WON'T OCCUR UNTIL LIST IS SUBMITTED FOR ANNUAL UPDATING.

TECHNICAL/PRODUCTION PERSON MAKES DECISION ON HOW NEW HAZARD INFO IS COMMUNICATED TO OPERATORS. WITH "UNIQUE" HAZARDS, THE NEW OI'S ARE REVIEWED PAGE-BY-PAGE WITH OPERATORS. IF THE TECHNOLOGY IS SIMILAR TO THAT WHICH IS ALREADY IN PLACE, THE OPERATORS ARE EXPECTED TO REVIEW THE OI'S ON THEIR OWN.

PROCESS DESIGN BASIS

PROCESS FILES IN JL HAVE BEEN FOUND TO BE LACKING COPIES OF ALL PROCESSES, SO A "MASTER" FILE IS BEING SET UP IN SUE BOWEN'S OFFICE TO PROVIDE READY REFERENCE FOR CONSULTANTS AND ATOS.

NEW TECHNICAL STANDARDS (SINCE '89) USED FOR DMA 450 PROCESS SHOWN INTENSIVE APPROACH TO HAZARDS OF INDIVIDUAL RAWS. HAZARDS OF PROCESS STEPS ARE COVERED IN PHRS. A PROCESS UPDATE WILL NOT NECESSARILY TRIGGER AN OI UPDATE, BUT THIS SHOULD NOT CREATE A HAZARD SINCE THE OI WILL BE "CURRENT" WITH ALL TA'S.

PROCESS CHEMISTRY IS DESCRIBED AS BEST AS IT'S UNDERSTOOD. SIDE RXNS, BY-PRODUCTS ARE ONLY DESCRIBED IF THEY ARE DEEMED "SIGNIFICANT" BY THE R&D CHEMIST.

DESCRIPTION OF SAFETY AND HEALTH CONSEQUENCES OF PROCESS DEVIATIONS ARE DONE ON AN EXCEPTION BASIS. MOST DEVIATIONS IN EO CENTER LEAD TO QUALITY, RATHER THAN SAFETY, PROBLEMS (COLOR FORMATION).

PLC'S FOR ETHOXYLATORS PROVIDE "FAIL SAFE" PROTECTION DURING LOSS OF UTILITIES WHICH REMOVE RELIANCE ON OPERATOR ACTION FOR CORRECTIVE ACTION. THIS PROTECTION IS NOT IN PLACE FOR KETTLES LACKING PLC CONTROL (PROJECT ACTIVITY UNDER WAY TO INSTALL THIS CAPABILITY).

EQUIPMENT DESIGN

VESSELS, INSTRUMENTATION, AND INTERLOCKS ARE DESCRIBED IN DETAIL IN A SERIES OF OPERATING PROCEDURES (VS. INCLUSION OF SAME INFO IN MULTIPLE OI'S). BLUEPRINTS, PUMP CURVES, RELIEF INFO, ETC NOT KEPT IN BUILDING FILES TO ENSURE INFO IS CURRENT WHEN NEEDED.

APPEARS TO MEET NECESSARY DESIGN CODES REFERENCED EXCEPT FOR NFPA, ALONG WITH ELECTRICAL AND PIPE CODE DISCREPANCIES NOTED ABOVE.

NO ENERGY BALANCES EXIST FOR EO PROCESSES.

SPRINKLER SYSTEM ON PET ADDITIVES SIDE OF EO CENTER IS NOT ADEQUATE, LIMITED BY SUPPLY CAPACITY OF WATER LINE. PROJECT ACTIVITY UNDER WAY TO REMEDY SITUATION.

II. PROCESS HAZARDS ANALYSIS

GENERAL

CONSEQUENCES OF VARIETY OF FAILURES IS AVAILABLE, BUT NOT INCLUDED IN SITE ER PLAN.

NO EMERGENCY RESPONSE PROCEDURES FOR CATASTROPHIC FAILURES OF SO2 SYSTEM.

PROCESS HAZARD REVIEWS

SEVERAL PHR'S WERE ADDED TO BUILDING SCHEDULE IN RECOGNITION OF EXISTING HAZARDS THAT HAD NOT BEEN PREVIOUSLY ADDRESSED: EO T/C MOVEMENT FROM THE PLANT GATE TO EO UNLOADING SPOT; CATALYST FEEDING OPERATION.

AN REVIEW OF 4 PHR'S FOR THE EO CENTER SHOWED GOOD AWARENESS OF "OUTSIDE" FACTORS (OVERHEAD PIPES THAT MIGHT LEAK, AIR MOVEMENT FROM AGITATOR DRIVE). MOST OF THE PHR COMMITTEE'S LACKED PARTICIPATION FROM WAGE ROLL EMPLOYEES, LARGELY DUE TO CONFLICTS WITH THE ROTATING SHIFT SCHEDULE.

CWIK JLDOC SYSTEM USED TO TRACK STATUS OF PHR'S. THE START OF THE ONE YEAR LIMIT ON CLOSURE OF PHR'S BEGINS THE DATE THE PHR NUMBER WAS ISSUED, NOT THE DATE THE PHR STATUS REPORT WAS ISSUED. IN SEVERAL EXAMPLES, THE LAG BETWEEN THE ISSUANCE OF THE NUMBER AND THE STATUS REPORT DATE WAS 4-6 MONTHS.

EO CURRENTLY HAS ELECTRIC VALVES IN PLACE ON THE EO STORAGE TANK VENTS. IN THE EVENT OF AN ELECTRICAL FAILURE DURING AN UNLOADING OPERATION, THESE AUTOMATIC VALVES WILL REMAIN LOCKED IN THEIR EXISTING POSITION. DURING THIS EVENT, AN OPERATOR MUST REMEMBER TO CLOSE A MANUAL VALVE TO PREVENT VENTING THE TANK CONTENTS TO THE ATMOSPHERE.

NO SYSTEM IN PLACE TO TRACK SPECIFICS OF OPEN RECOMMENDATIONS, WHICH MAY CONTRIBUTE TO LOW PRIORITY FOR CRITICAL IMPROVEMENTS. THIS IS CURRENTLY BEING ADDRESSED THROUGH THE EXPERIENCE OF THE PRODUCTION STAFF, BUT RAPID TURNOVER IN PERSONNEL COULD UNDERMINE THIS APPROACH.

MOST SCHEDULED PHR'S HAVE AT LEAST HAD A STATUS REPORT ISSUED. REPORTS FROM '89 ARE CIRCULATING FOR CLOSURE. GENERALLY GOOD PROGRESS SEEN IN THIS AREA.

III. MANAGEMENT OF CHANGE - TECHNOLOGY

DETAILS OF TA COMMUNICATED TO OPERATORS VIA MODIFIED OI'S AND, WHERE DEEMED NECESSARY, COMMENTS IN "NIGHT BOOKS". ELECTRONIC APPROVAL OF TA'S HAS BEEN USED DURING TIME CRUNCHES, BUT THIS APPROACH MAY NOT PROVIDE AN "OFFICIAL" SIGNED COPY FOR AN OPERATOR TO SEE SHOULD HE/SHE REQUEST IT.

TMR'S INCLUDE A COPY OF MSDS FOR ANY NEW MATERIALS INTRODUCED TO AREA, BUT TMR WILL NOT APPEAR ON THE OPERATING FLOOR. TMR IS NOT SIGNED BY BARBARA DAWSON UNTIL MSD SHEET IS IN ELECTRONIC FILE.

CHANGES TO OI'S OFTEN OCCUR DURING START-UP ON TA. CHANGES MAY BE "MINOR," BUT ARE OUTSIDE OF THE NORMAL AUTHORIZATION SYSTEM FOR TA APPROVAL. LEFT TO DISCRETION OF CONSULTANTS AND ATO'S.

VERY FEW OPERATORS WILL ASK TO SEE COPY OF TA TO PROVE CHANGE IS AUTHORIZED. MOST RELY ON SEEING AUTHORIZED OI'S (SIGNED BY AREA MGR).

IV. OPERATING INSTRUCTIONS

SAFETY & OCCUPATIONAL HEALTH

TOXIC EFFECTS OF THE VARIOUS RAW MATERIALS ARE DISCUSSED IN THE INTRODUCTORY PAGES OF THE OI'S. SPECIFIC PPE NEEDS ARE ADDRESSED AT THE ACTUAL OPERATING STEP WITHIN THE OI'S.

THE RESPONSE TO A COMPLETE LOSS OF UTILITIES IS NOT SPECIFICALLY ADDRESSED IN OI'S. THE LOSS OF MULTIPLE UTILITIES IS ADDRESSED IN THE PLC PROGRAMMING. SUGGEST DEVELOPING A MATRIX BY PRODUCT ADDRESSING SPECIFIC RESPONSE STEPS FOR THE LOSS OF UTILITIES TO BE INCLUDED IN "EMERGENCY SHUTDOWN" PROCEDURE. THIS CAN ALSO SERVE AS A TRAINING TOOL. PROCEDURE DOES NOT CURRENTLY EXIST FOR THE EO CENTER.

SPILL AND CHEMICAL RELEASE CONTROL

THE LIST OF CHEMICAL HAZARDS IN THE EO CENTER IS NOT INCLUDED IN A SPILL CONTROL OP, NOR SHOULD IT BE AS THIS WOULD SUBJECT IT TO A 2->3 YEAR REVIEW CYCLE.

THERE IS GOOD COVERAGE OF SPILL CONTROL REQUIREMENTS IN THE AREA OP, EXCEPT FOR TRAINING IN SPILL CONTROL RESPONSE. THIS INFORMATION IS READILY ACCESSIBLE, OTHER THERE WAS SOME QUESTION AS TO HOW MANY PEOPLE KNEW OF ITS EXISTENCE.

THE AREA HAS HAD 1 SPILL YTD. A DMA-65SD T/C WAS FOUND TO HAVE A LEAKING LEAKING INTERNAL VALVE AND WAS SENT TO RAIL YARD FOR REPAIRS. WHILE AT YARD, A LEAKING STEAM COIL WAS NOTICED. THE CAR WAS NOT PLACARDED OR TAGGED FOR THE LEAKING COIL. EVENTUALLY, THE T/C WAS RETURNED TO THE AREA WITHOUT NOTIFICATION OF THE LEAK. THE CAR WAS RELOADED AND SUBSEQUENTLY LEAKED. EO NOW TRACKS CARS SENT FOR REPAIRS ON A BOARD AND CONFIRMS REPAIRS PRIOR TO USE.

EQUIPMENT AND INSTRUMENTATION

SKETCHES OF ALL EQUIPMENT SETS APPEAR IN THE APPROPRIATE OI'S FOR KETTLES NOT CONTROLLED BY THE PLC. FOR THE PLC CONTROLLED VESSELS, THE PANEL GRAPHICS ARE USED TO DISPLAY THE EQUIPMENT CONFIGURATIONS.

KEY INSTRUMENTS ARE LISTED IN A BUILDING OP, SIMILAR TO THE OP FOR EQUIPMENT.

Operating Steps

As part of the OI updates to comply with ISO-9000 requirements, OI's are being reviewed by knowledgeable operators for agreement with field experience. Many temperature and pressure targets are being modified to include a range (100 +/- 2) instead of just a target (100).

There is no explanation for the need for a minimum 9 psi nitrogen pressure (to avoid a flammable concentration region) in the Merpol OJ OI's.

Checksheets are used for start-up of products that are not covered by the PLC. For products controlled by the PLC, a series of interlocks ensure appropriate completion of inerting, valve settings, etc.

Direct deliveries from the SO2 vendor in color-coded cylinders are used to minimize risk of using wrong material. However, there is no specific statement in OI's requiring operators to confirm identity of material by reading label.

COA's for "critical" raw materials (essential to finished product quality) are faxed to QCL prior to receipt of material. The overall raw material acceptance procedure is defined in the unit-wide raw material procedure.

Safe Work Practices

This topic addressed in Safety How

Technology Center

Area OI's are currently re-issued on a 2 year review cycle. Their conformance with process technology is recorded in a statement on the signature page of the OI's.

As stated above, operators are now intimately involved in the OI review process as part of the effort to comply with ISO-9000 requirements. Major changes to the OI's are communicated via a special training session for the operators. Operators are made aware of minor changes through a note to their Team Mgr.

During the field tour, several OI's were spot checked for "unauthorized changes". All were found to be in compliance with PSM requirements (initialed by Area Mgr).

V. PERSONNEL TRAINING AND PERFORMANCE

Compliance with mandated requirements ranges from good to poor, depending on the subject matter. Historically there has been a low awareness level of the amount of mandated training that is needed.

TRAINING PROGRAMS ARE LIMITED BY THE AVAILABILITY OF A SUITABLE TRAINING FACILITY.

THERE IS ONLY A LIMITED AMOUNT OF TRAINER SELECTION TAKING PLACE ON THE SITE, AS GUIDELINES DO NOT CURRENTLY EXIST.

A NEW EMPLOYEE CHECKLIST IS NOT YET AVAILABLE, BUT IS BEING DEVELOPED. THE SITE'S 30/60/90 DAY FORM FOR NEW EMPLOYEES IS IN USE.

THERE IS NO FORMAL BUDGET FOR OPERATOR TRAINING. TO DATE, 23 OPERATORS HAVE ATTENDED THE FIRST WEEK OF A 3 WEEK BASIC SKILL TRAINING PROGRAM (NUS) THROUGH PPD.

REFRESHER AND BASIC JOB TRAINING FOR EHS SKILLS IS IN GOOD SHAPE THROUGH THE USE OF CLASSROOM AND FIELD TRAINING. TRAINING WEAKNESS USUALLY EXIST WHERE NOT MANDATED BY STATE OR FEDERAL REQUIREMENTS.

LESSON PLANS ARE BEING DEVELOPED (SIMILAR TO THE FORMAT USED BY BOB LAWLESS) FOR INITIAL AND REFRESHER TRAINING.

A LISTING OF THE MANDATED TRAINING HAS BEEN DEVELOPED ALONG WITH A RATING FOR EACH TRAINING REQUIREMENT IN THE FIRST STEP TOWARDS DEVELOPING A PLAN TO MEET ALL OF THE MANDATED TRAINING REQUIREMENTS. THE UNIT IS FOCUSING ON COMPLIANCE WITH MANDATED TRAINING BEFORE ATTEMPTING TO EXPAND BASIC SKILL TRAINING.

OPERATORS ARE GENERALLY QUALIFIED FOR THEIR JOB THROUGH THE "BUDDY SYSTEM". EACH BUILDING W/IN PERF. PRODUCTS IS DEVELOPING A QUALIFICATION LIST AS PART OF THE ISO-9000 CERTIFICATION EFFORT.

VI. CONTRACTOR SAFETY

THE PERF. PRODUCTS UNIT AND THE EO CENTER UTILIZE DIRECT CONTRACTING. CONTRACTORS ARE SELECTED FROM A ML&S LIST OF VENDORS. THE AREA USUALLY RELIES ON ML&S FOR SAFETY STATISTICS ON THESE CONTRACTORS. ON A LIMITED BASIS, PERF. PRODUCTS REPRESENTATIVES HAVE PARTICIPATED IN THE SAFETY MEETINGS OF SOME CONTRACTORS TO AUDIT THE CONTENT OF CONTRACTOR SAFETY MEETINGS.

PLANT ORIENTATION IS HANDLED BY THE PERF. PRODUCTS CONTRACT ADMINISTRATOR(S) USING SITE PROGRAM DEVELOPED BY DAVE SPARKS. THE AREA ORIENTATION IS HANDLED BY THE BUILDING PROPRIETOR (ZEKE EVANS) USING A CHECKSHEET FROM THE SITE PROGRAM. THIS AREA ORIENTATION INCLUDES RALLY SPOTS, HEADCOUNT PROCEDURES, AND SAFETY SHOWER LOCATION.

NEW ADDITIONS TO CONTRACTOR CREWS ARE PROVIDED ORIENTATION THROUGH ADDITIONAL SAFETY MEETINGS. THE SKILL LEVEL OF THE CONTRACTOR CREW IS NOT EVALUATED IN ADVANCE, BUT FIELD AUDITS (W/ AND W/OUT CONTRACTOR SUPERVISORY PERSONNEL) ARE CONDUCTED TO ENSURE QUALIFICATION SKILLS.

CONTRACTOR EQUIPMENT IS CHECKED BY DFO (DUPONT FLEET OPERATIONS) OR BY PLANT EXPERTS FROM CONSTRUCTION OR OTHER MECHANICAL GROUPS.

VII. MANAGEMENT OF CHANGE - PERSONNEL

THE SITE CURRENTLY HAS NO GUIDELINES REGARDING THE MANAGEMENT OF PERSONNEL CHANGE. THERE IS NO SPECIFIC REQUIREMENT FOR NEW SUPERVISION TO DEMONSTRATE PROFICIENCY IN THEIR NEW ASSIGNMENT.

FOR THE EO CENTER, THE ANTICIPATED RETIREMENT OF ZEKE EVANS PROMPTED THE ASSIGNMENT OF MEL STILES TO THE BUILDING TO PROVIDE ADEQUATE TRAINING TIME.

VIII. UNUSUAL INCIDENT INVESTIGATION/REPORTING/COMMUNICATION

LIMITED TRACKING OF CLOSURE OF OPEN ITEMS FOR UI/SIR/EIR RECOMMENDATIONS FOR THE ENTIRE UNIT. SYSTEM HAS BEEN IN PLACE FOR QUARTERLY REVIEW, BUT THE STATUS REPORTS HAVE SEEN NOT BEEN CIRCULATED RECENTLY DUE TO ISO WORKLOAD.

IX. EMERGENCY PLANNING AND RESPONSE

ALL EO CENTER OPERATORS (3/SHIFT) PARTICIPATE IN THE 8 HOUR ANNUAL FIRE BRIGADE TRAINING. NEW EMPLOYEES ARE ESCORTED TO EACH EVACUATION BUTTON, FIRE BOX, AND EMERGENCY SHUTDOWN SWITCH.

PLANS ARE IN PLACE TO TRAIN ALL PERF. PRODUCTS WAGE ROLL PERSONNEL TO COMPLY WITH HAZWOPER "FIRST RESPONDER" LEVEL. CURRENTLY CONSIDERING ADDITIONAL TRAINING FOR EHS OPERATORS TO PROVIDE "SECOND RESPONDER" LEVEL QUALIFICATION.

E&D MANUAL FOR UNIT IS BEING BROUGHT INTO COMPLIANCE. TRAINING IS SCHEDULED TO START PROCESS OF BRINGING BUILDING MANUALS INTO COMPLIANCE. OVERALL, THE NEEDS AROUND HAZWOPER HAVE BEEN RECOGNIZED AND ARE BEING ADDRESSED THROUGH UPGRADES TO PROCEDURES AND TRAINING.

THE EO CENTER EVACUATION ALARM HAS GENERALLY BEEN TESTED AT NIGHT. THERE IS NO RECORD OF FREQUENCY FOR THE TESTING OF THE 5 SWITCHES.

BUILDING EMERGENCY DRILLS ARE NOT CURRENT.

X. AUDITING (PERFORMANCE VS. PSM GUIDELINES)

XI. QUALITY ASSURANCE

CRITICAL EQUIPMENT QUALITY ASSURANCE PROCEDURE IS DEFINED IN MAINTENANCE PROCEDURE MP-32 AND ML&S INSPECTION PROCEDURE.

DESIGN CRITERIA ARE USUALLY COMMUNICATED TO PRODUCTION AND MECHANICAL PERSONNEL THROUGH A "PROJECT TEAM" USUALLY CONSISTING OF REPRESENTATIVES FROM DESIGN, R&D, AND PRODUCTION. A SCOPE OF WORK IS

USUALLY USED AS THE COMMUNICATION FORUM. WAGE ROLL INVOLVEMENT IS NORMALLY SEEN AT THE PRINT REVIEW STAGE.

FABRICATION QA IS PROVIDED BY DICK GESSNER OR CHARLIE HALL (50 MILE RADIUS OF PLANT) OR BY ML&S (MORE THAN 50 MILES FROM PLANT). THE DUPONT VENDOR RATING SYSTEM PROVIDES A SECONDARY APPROACH FOR ONLY SPOT CHECKING VENDORS ACCORDING TO THEIR SUPPLY HISTORY. THERE IS A MINIMAL AMOUNT OF DIRECT CONTACT WITH VENDORS, ALTHOUGH THERE ARE SEVERAL INDIVIDUAL EXCEPTIONS.

THERE IS MINIMAL USE OF A CHECKSHEETS FOR VERIFICATION OF EQUIPMENT INSTALLATION AGREEMENT WITH DESIGN. GENERALLY, PUNCHLISTS OR PHR RECOMMENDATIONS ARE USED TO ENSURE PROPER INSTALLATION.

XII. MECHANICAL INTEGRITY

MOST OF THE MECHANICAL INTEGRITY PROCEDURES ARE DRIVEN BY EITHER CODE REQUIREMENTS (PRESSURE VESSELS) OR TCPA REGULATIONS (EHS SERVICE). THICKNESS TESTING FOR NON-RATED VESSELS IS PROVIDED FOR POST-INCIDENT INVESTIGATIONS. SUBSTANTIAL INSTRUMENT CALIBRATION EFFORT UNDER WAY AS PART OF ISO-9000 CERTIFICATION PROGRAM.

MOST OF THE MECHANICAL PROCEDURE TRAINING IS ACCOMPLISHED VIA LARGE GROUP MEETINGS WHICH IS FACILITATED BY DAYWORK SCHEDULE. SELECTED CLASSROOM TRAINING PROGRAMS ARE USED WHERE AVAILABLE/APPROPRIATE. HARD COPIES OF TRAINING RECORDS ARE RETAINED WHERE REQUIRED BY OSHA RULES. OTHERWISE, VTS IS USED TO RECORD TRAINING HISTORY.

A $5M/MONTH BUDGET EXISTS TO FUND TRAINING ACTIVITIES. IN ADDITION, BOB SLIPPEY HAS BEEN REJOINED THE AREA FROM THE PDC TO LEAD TRAINING PROGRAMS AND IMPROVE DOCUMENTATION.

THERE IS A LIMITED AMOUNT OF REFRESHER TRAINING PROVIDED FOR MECHANICS. MOST OF THE NON-REGULATORY TRAINING FOCUSES ON ENHANCEMENT ON SKILL FLEXIBILITY.

TRAINERS ARE SELECTED VIA "WORD OF MOUTH" AND REPUTATION AS NO SITE GUIDELINES FOR TRAINER SELECTION EXIST.

MECHANICS ARE QUALIFIED FOR JOBS VIA OBSERVATION AND "GUT FEEL" OF SUPERVISORS AND PEERS. THE "BUDDY SYSTEM" IS USED FOR TRAINING IN THE AREA, WHILE THE PDC IS GENERALLY THE HOME OF CLASSROOM TRAINING.

NO FORMAL QUALITY CONTROL PROCEDURE EXISTS FOR INCOMING MAINTENANCE MATERIALS. GENERALLY RELY ON TOOL ROOM MEN TO OVERSEE QC. GASKET VERIFICATION PROGRAM (BORROWED FROM PPD) IS BEING STARTED IN THE AREA.

RELIABILITY ENGINEERING IS NOT YET IN PLACE, BUT IS EXPECTED TO BE PART OF MERP CERTIFICATION EFFORT DURING '92. SEVERAL PILOT PROGRAMS (PUMPS RUNNING, STEAM TRAPS) AND ESTABLISHED PROGRAMS (LUBRICATION ROUTES, VIBRATION ANALYSIS) ARE IN PLACE. SOME EQUIPMENT DETAILS EXIST IN 3MCS, BUT EQUIPMENT HISTORY COMMENT SECTION HAS NOT BEEN UTILIZED.

RECENT RE-ORGANIZATION OF PLANT QA GROUP HAS TRANSFERRED RESPONSIBILITY OF SAFETY EQUIPMENT TESTS TO AREAS. THIS TRANSFER TO THE AREA HAS APPARENTLY CREATED A GAP REGARDING INTERPRETATION OF VESSEL AND PIPE INSPECTION DATA. IN THE CASE OF SEVERAL VESSELS AND PIPE THICKNESS MEASUREMENTS, A HISTORY IS BEING DEVELOPED WITH A FOCUS ON "CHANGE", BUT THERE DOES NOT APPEAR TO BE A MEANS FOR DECIDING HOW MUCH CHANGE IS SIGNIFICANT AND WHAT MINIMUM THICKNESS IS ACCEPTABLE. RECORDS ALSO INDICATE DEFICIENCIES IN EO TANKS (1"X 6", 1/16 DEEP CRATER, WELDS "WASHED OUT", BUT "BLESSED BY EXPERTS") WITH NO DOCUMENTATION OF WHO IS MAKING THE "APPROVAL".

SECTIONS OF EO PIPE ARE IDENTIFIED AS "OUT OF CODE", BUT LACK ANY INSPECTION RECORD DUE TO PENDING REPLACEMENT ACTIVITY. ONE ROUND OF THICKNESS TESTS AROUND EO & SO2 LINES HAVE BEEN COMPLETED.

NO "AS FOUND" COMMENTS ARE AVAILABLE ON RV'S, SINCE ALL VALVES HAVE TO BE DECONTAMINATED PRIOR TO DELIVERY TO THE CENTRAL SHOP.

XIII. MANAGEMENT OF SUBTLE CHANGES

NO SITE OR UNIT GUIDELINES EXIST.

XIV. PRE-STARTUP SAFETY CHECKLISTS

CHECKLIST FORM INCLUDED IN PSM MANUAL, BUT THE FORM IS NOT CONSISTENT WITH THE NEW S&OH GUIDELINES. MOST OF THE PRE-STARTUP INSPECTIONS IN EO ARE ACCOMPLISHED VIA PUNCHLISTS GENERATED OUT OF PHR'S AND/OR THE EXPERIENCE OF THE BUILDING PROPRIETORS.

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FIELD TOUR NOTES

TWO OPERATORS WERE INTERVIEWED IN THE FIELD AND FOUND TO BE KNOWLEDGEABLE OF AUTHORIZATION REQUIREMENTS AROUND OI/TA CHANGES AS WELL AS EVACUATION RESPONSES.

SEVERAL CONCERNS SURFACED AROUND GROUNDING. THERE IS NO STANDARD INSPECTION FREQUENCY ON GROUND WIRES, WHICH HAS ALLOWED SEVERAL TO BECOME BADLY WORN. ONE GROUNDING CLAMP WITH A BROKEN WIRE WAS FOUND ATTACHED TO A T/T AND CORRECTED. THE T/C GROUNDING ALARM SYSTEM (FIELD ALARM LIGHTS UP AND RINGS IF A GROUND WIRE IS DISCONNECTED) DID NOT WORK WELL. NO INDICATION OF INSPECTION FREQUENCY ON THIS DEVICE.

SEVERAL ITEMS (SAFETY SHOWER LIGHTS, LIGHT FIXTURES) IN THE REACTOR ROOM DO NOT MEET THE REQUIRED I-2-B ELECTRICAL CLASSIFICATION. THE AREA IS AWARE OF THESE PROBLEMS. CONSTRUCTION WILL START THE UPGRADE WORK WITHIN 2 WEEKS AS PART OF A CAPITAL PROJECT.

A NUMBER OF LIGHTS AND THE ANNUNCIATOR ON THE PET ADDITIVES CONTROL PANEL WERE FOUND TO BE NOT WORKING. NO INDICATION THAT THE PANEL LIGHTS HAD BEEN TESTED RECENTLY. IN THE ETHOXYLATOR CONTROL ROOM, SEVERAL LIGHTS WERE ALSO BURNED OUT BUT THE CORRECT SIZE SPARES ARE IN SHORT SUPPLY. CHECK SHEETS ARE KEPT DAILY AND SHOW THAT THE PROBLEM HAD BEEN OBSERVED.

THE DELUGE SYSTEM (3-01A) FOR ONE OF THE BULK STORAGE TANKS APPEARED TO BE MISSING A "TEST/ALARM" SWITCH.

THE ISSUE OF BARRICADING AROUND THE WEST WALL OF THE EO CENTER WAS DISCUSSED, AS THE QUESTIONABLE STRUCTURAL INTEGRITY MIGHT PRESENT A HAZARD TO LOCAL PERSONNEL. WORK IS UNDER WAY TO RELOCATE LINES ADJACENT TO THE WALL PRIOR TO DISMANTLEMENT.

A SPOT CHECK OF AN OPERATOR'S ABILITY TO ACCESS THE ELECTRONIC MSDS DATA BASE REVEALED A GOOD UNDERSTANDING OF SEVERAL WAYS TO RETRIEVE INFORMATION.

A SPOT CHECK OF TWO PHR RECOMMENDATIONS (GROUND WIRE FOR UNLOADING PUMP, CHECK VALVE IN JET LINE) FOR THE K-3 INSTALLATION INDICATED THAT THE FIELD INSTALLATION WAS CONSISTENT WITH THE RECOMMENDATIONS.

NO INDICATION OF TEST FREQUENCY ON "FEEDING EO" WARNING LIGHT OUTSIDE OF REACTOR ROOM.

A FLAME PERMIT FOR 2 PAINTERS WAS NOT PROPERLY LOCATED AT THE JOB SITE. IT HAD BEEN LEFT IN THE TEAM MGR'S OFFICE.

NFPA WEAKNESSES EXIST FOR THE NUMBER OF FIRE EXITS AND FIRE PROTECTION.