

2/8/85

ZERO DISCHARGE ENVIRONMENTAL STUDY - CHEMICALS
LAKE CHARLES

1. Decision was made in 1983 to launch Phase I Engineering study of ZD at Lake Charles.
2. Definition was made for BPT and BAT projects and what regulatory problems these would address/solve leaving only the ZD and SPCC portions. Post BAT water needing reduced to zero was 6,000 GPM.
3. ZD Project was split into 25 tasks and full time process engineers and estimators were assigned.
4. By September, 1985, Phase I Engineering progress was at 80.5% average completed. All estimates were completed for 8 of the 25 tasks. ALL ZD PROJECT WORK WAS SUSPENDED AND PUT ON THE SHELF DUE TO ECONOMIC FACTORS CONFRONTING CHEMICALS.
5. Twenty-four thousand two-hundred (24,200) man hours had been expended at that point or \$225M for Process Team Members only working at Lake Charles.
6. Total engineering expenditures were around \$1,500,000. The capital costs estimated in 1985 dollars for the 8 tasks completed was \$83MM. This was beyond BAT and NPDES. The Total Task for ZD alone was probably \$200MM.
7. The SPCC portion of the study was scoped and estimated completely. Three packages were assembled for Plants A, B, C. The 1984 dollar costs were approximately \$14MM. Meanwhile Louisiana passed a Spill Control Act and Lake Charles began to implement all of those portions of SPCC that were required by law or that were Best Management Judgment (diking, etc.).
8. NO FURTHER WORK DONE TOWARDS COMPLETION. There was not a firm technology base in all cases of ZD process design. Some of the ZD processes involved exotic, unproven technology yet to be proven, i.e., reverse osmosis, etc.

ZERO DISCHARGE ENGINEERING STUDY - CHEMICALS
NATRIUM

1. Conceived by V. A. Sarni in 1978 in response to a blue-sky "goal" (not regulation) of the San Muskie's Clean Water Act of eliminating process pollutants from water discharges. In fact the permits issued are NPDES (National Pollution Discharge Elimination System).
2. Decided to see what this meant to one of our totally integrated Chlor-Alkali plants with power producing capabilities. Natrium chosen.
3. On March 27, 1979, ZD Engineering project was organized in Central Engineering as high priority item with full time process, mechanical, and cost estimating people assigned.
4. ZD goal defined to reduce polluted water discharges to zero. Any water coming in contact with the process would be treated/recycled/revised and to spend the money for other projects only once. (See definitions attached)
5. Phase I - \$600M - Conceptualization Engineering
Phase II - \$1,108M - Scope Engineering - 8 projects
6. Would include BMP, BPT, BAT, ZD, SPCC and regulatory deadlines--ten Task Groups.
7. Total cost for Natrium ZD estimated at \$57.5MM in 1981 dollars (would now be near \$100MM). This includes all regulatory areas previous to ZD attainment leaving \$28MM as pure ZD costs to go the final step. Estimates were ACT grade.
8. As a matter of fact, some "Immediate Action and Maintenance" and SPCC items have been completed. We are just now doing some of the BAT items, since the Organic Guidelines have been eleven years in the making at EPA, i.e., we still do not have a steam stripper for chlorobenzene removal from discharge waters.
9. ZD program presented to Business Managers, Operations, Environmental Affairs and Central Engineering February 18, 1982.

Conclusion: All future ACTS after 11/1/83 would include an assessment of practicality of going to ZD and must state how the equipment installed now impacts and is directed towards ZD. Only those items being driven by regulations or common sense operating philosophy would be done now unless costs for ZD were feasible.

ZERO DISCHARGE

December 1982

The scope of zero discharge as applied to PPG chemicals operations includes the following practices:

1. No process contaminated water will be discharge outside the plant boundaries.
 - a. Process waters are waters that come into direct contact with process raw, intermediate or product materials.
 - b. Process waters also include:
 1. Cooling tower and boiler blowdown
 2. Barometric condenser discharge
 3. Runoff from process pads*
 4. Once through heat exchanger cooling water at a lower pressure than the process
2. Storm runoff outside of process areas and higher pressure heat exchanger cooling waters are not process water.
3. SPCC controls will be established as necessary to prevent the discharge of spills and leaks outside of plant boundaries.

*System to be designed to contain a 24 hour, 25 year rain with pumps sized to a 15 minute, 25 year rain intensity rate. Reference is made to EPA 40CFR, Section 415.23 for a definition of Zero Discharge as applied by EPA to BAT for the aluminum sulfate industry.

(Alterations to this criteria may be necessary to develop a practical engineering design.)

(This is the only variance from the Natrium Zero Discharge Plant, which was designed for a steady rain fall rate of $\frac{1}{2}$ " per hour, continously.)

11/1/83

Zero Discharge Policy

It is the objective of PPG Industries, Inc., to achieve the goal of the Clean Water Act by eliminating the discharge of pollutants into navigable waters or into groundwaters. PPG will assign priorities to those process streams which discharge toxic pollutants and will emphasize the achievement of the goal through process modifications to recycle, reduce, or eliminate pollutants where practical rather than by supplemental control technology. Such analysis should recognize and avoid the problem of merely shifting pollutants from one medium to another.

All Authorizations for Capital Transaction requests to construct new, or modify existing, process units shall include an assessment of the practicability of the elimination, recycling or reduction of process water discharges as well as a cost-benefit assessment of available treatment technologies.

SL 106262

**PROPOSAL SUBMITTED
TO
PPG INDUSTRIES
LAKE CHARLES, LA
FOR
ZERO-DISCHARGE OPTIONS**

**Resources Conservation Co.
Bellevue, Washington**

AUGUST 1985

RESOURCES CONSERVATION CO.



BELLEVUE WASHINGTON 98004

RCC PROPOSAL NO. E-1114

SL 106263

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