

ILLINOIS POLLUTION CONTROL BOARD
May 27, 1982

IN THE MATTER OF:)
) R80-5
RACT II RULES,)
CHAPTER 2: AIR POLLUTION)

PROPOSED OPINION OF THE BOARD (by I. Goodman):

I. General Introduction

This proceeding is undertaken pursuant to the Board's authority in Section 10 of the Environmental Protection Act (Act) to adopt regulations to promote the purposes of the Title II of the Act. Those purposes include the restoration, maintenance and enhancement of the purity of the air and the assurance that the degree of control necessary to prevent pollution is given to all air contaminants (Section 8). It is also the purpose of Title II to avoid duplicative, overlapping or conflicting state and federal regulatory systems (Section 9.1). It is the purpose of these regulations both to improve and protect air quality in Illinois and to meet the requirements of the Federal Clean Air Act (CAA).

On April 3, 1980 the Board authorized for filing a proposal of the Illinois Environmental Protection Agency (Agency) to adopt certain regulations limiting emissions of volatile organic materials (VOM) from certain categories of sources in the state. Part of the proposal concerns refinements of similar rules adopted by the Board on July 12, 1979 in its proceedings R78-3 and -4, known as "RACT-I", and part concerns rules relating to other categories of sources (known as "RACT-II").

Six technical hearings were held in this proceeding in June and November of 1980. The Economic Impact Study entitled, "Effect of Ract II Environmental Controls in Illinois," (Doc. No. 81-28) was prepared by RCF, Inc. under contract with the Illinois Institute of Natural Resources and was received by the Board in August of 1981. Three economic hearings were held in November of 1981.

"RACT" is an acronym for the phrase "reasonably available control technology" as used in Part D of the CAA, 42 U.S.C. §7401, et seq. Section 172 of the CAA requires that State Implementation Plans, as a precondition for the construction or modification of any major stationary source in any non-attainment area, must provide for the achievement of "reasonable further progress" toward

air quality goals, including such emission reductions from existing sources as may be achieved through the adoption of "reasonably available control technology." RACT is not defined in the Clean Air Act, however, USEPA rules (40 CFR 51.1(o), general policy statements, and industry specific "Control Technology Guidelines" (CTG) describe Federal RACT requirements. In general, RACT is defined as control technology which is both technically available and economically reasonable for a particular industry.

In specific, USEPA has issued CTG's describing technology it considers to be "reasonably available" for specific categories of industrial activity. USEPA policy has been to approve state RACT regulations as meeting CAA requirements if they result in no more than a 5 percent deviation from the emission reductions which would be achieved by applying the CTG's verbatim. Any greater deviation from the CTG's must be supported by the particular needs of the state.

USEPA issued CTG's covering nine industrial categories in 1978. The Agency's 1980 proposal contained proposed controls for the following seven categories:

1. Graphic Arts - Rotogravure and Flexography
2. Petroleum Refinery Leaks
3. Surface Coating of Miscellaneous Metal Parts & Products
4. Petroleum Liquid Storage in External Floating Roof Tanks
5. Manufactured Synthesized Pharmaceutical Products
6. Manufactured Pneumatic Rubber Tires
7. Perchloroethylene Dry Cleaning Systems

Two other 1978 CTG categories, Gasoline Tank Trucks and Factory Surface Coating of Flatwood Paneling, were not included in the proposal and have not been considered in this rulemaking. Gasoline Tank Trucks are covered by existing Board rules. Factory Surface Coating of Flatwood Paneling is not focused on because no factories of this nature exist in Illinois at this time.

II. Statewide Applicability of RACT II Controls

A. General Technical and Economic Considerations

The Agency proposal did not propose to change the policy adopted in RACT I of requiring RACT in both Attainment and Non-attainment (NAA) counties. However, several industrial representatives informally proposed such a change and presented arguments on this issue.

Generally, the arguments made for applying RACT II only in NAA are the following:

1. The Federal Clean Air Act requires that RACT be applied only in NAA. Illinois industries have expressed concern that they would be at a competitive disadvantage vis-a-vis states which have adopted RACT only for NAA's. (R. 879, 1328-29, 1380-81.)
2. RACT should not be applied in attainment counties unless there is quantifiable evidence that emissions from attainment counties are impacting NAA counties. (R. 581-2, 874-876, 882-886.)
3. It is more cost-efficient to control dirtier areas. The benefits to be achieved by controlling sources in attainment areas are not as great as those which can be achieved by controlling in NAA. (Econ. R. 573-4.)
4. Statewide controls are not necessary to assure a margin for growth. (R. 550-560.)

The arguments made for retaining statewide applicability are the following:

1. Long Range Transport of Hydrocarbons

Testimony in the record of this proceeding cited several studies indicating that emission sources as far as 85 miles away may contribute to ozone levels in other areas. (R. 44.) Steve Tamplin, Manager of the Agency Air Quality Planning Section, testified that "it is unlikely that the ozone NAAQS will be achieved in urban areas in Illinois . . . , unless hydrocarbon emission levels in rural areas are reduced." The RACT I record, which originally adopted a statewide approach for RACT, considered ozone formation in greater detail than does the present record. That record contains significant testimony on the phenomena of long-range transport of hydrocarbons over distances ranging from 5-1,000 miles. (See Opinion of the Board, R. 78-3, 4, pp. 4-10; also Exhibits 36 and 37; and R. 1574-5 in the RACT I record; also see Illinois SIP, Volume 5, p. 10-6.)

2. The Existence of Relatively High Ambient Ozone Levels in Many Rural "Unclassified" Areas

In 1980, excursions of the 0.12 ppm one-hour ozone standard were monitored in a number of rural, small town, and small urban attainment areas. In addition, levels approaching the standard (0.10-0.11 ppm) have been measured in rural areas such as LaSalle, Braidwood and Robinson, Illinois. (R. 841-2. Also see 1980 Annual Air Quality Report, Ill. Environmental Protection Agency, Division of Air Pollution Control.)

3. Retention of An Adequate Margin for Growth in Attainment Areas

New industrial growth in attainment areas could be jeopardized if a margin for growth is not preserved. If an attainment or "unclassified" status is lost, "off-sets" will be required for new hydrocarbon sources in the area. Statewide applicability maximizes the opportunity for growth of hydrocarbon emitting industries and minimizes bureaucratic "red tape." (R. 842-4, 880.)

4. Adverse Impacts of Shifting Regulatory Requirements

If RACT is applicable only in NAA, as the classification of a county is changed, e.g., from "unclassified" to NAA or from NAA to attainment, the equipment, process, and/or program requirements would change. (R. 845-846; 889-91.)

5. Minimize Industry-Wide Inequities

If RACT is required only in NAA, a large pollution source in an attainment area may avoid RACT, while a small source in the same category, but located in an NAA, will be required to put on even greater controls to achieve reductions required of Illinois by USEPA. (R. 846.) This is most obvious in the Graphic Arts category where if a single large emission source in an attainment area were not regulated, the 1,000 TPY exemption level would have to be lowered to assure attainment of the ozone standards. (R. 1009; also see EcIS, p. 95.)

6. Minimize Inequities Between Counties

The 1979 SIP points out that there is no clear rationale for Springfield being classified as NAA, while Decatur is attainment. (Illinois SIP, Volume 5, p. 10-8.) If the transport of emissions generated in one county causes a neighboring county to be classified as NAA, it is futile to regulate industries only in the county experiencing the ozone, and not in the county generating the hydrocarbons.

7. Heavy Burden on Few Non-Attainment Areas

"Unclassified" and "Attainment" counties make up 81 out of 101 counties in Illinois. The burden for achieving all VOC reductions necessary to demonstrate attainment of the ozone standards throughout the state will fall entirely on the 20 NAA's if the rule is made applicable only in NAA.

(For a concise statement of the IEPA's arguments see: R. 829-849.)

B. Specific Issues

The Board agrees with the Agency statement that "the observed long-range transport phenomenon must be accounted for in any comprehensive hydrocarbon control program designed to successfully deal with ambient ozone concentrations in excess of the national standard." (R. 840-841.) The uncertainty surrounding the exact and quantifiable identification of the source of existing ozone problems across the state necessitates application of all hydrocarbon controls on a statewide basis. There is strong logic and evidence in the record of this proceeding of hydrocarbon transport, of significant ozone levels occurring throughout the state and of violations of the standard continuing to occur in several areas. (R. 829-849.) Also see the Record and Opinion of the Board in R. 78-3, 4; 1980 Annual Air Quality Report; and Illinois SIP, Volume 5.) On 72 of 153 days during the 1980 ozone season, at least one Illinois city or area was placed on an ozone advisory. Although several industrial representatives argued that recent ozone levels indicate that statewide controls are unnecessary, the evidence of changes in ozone levels over the 1979-80 periods is not generally considered conclusive. Notably, in the R81-20 proceeding, industry representatives supported a "bubble" rule which would allow emission sources at great distances (100-200 miles) to "bubble" VOM emissions on the basis of the long-range transport phenomena. (R. 578-579.) The 1980 Annual Air Quality Report, published by the Illinois EPA, does document short-term decreases in ozone levels; however, it also points out that the summer meteorology in 1979 and 1980 was not as conducive to the formation and transport of ozone as the previous years (1977, 1978). (Also see Econ. R. 272.)

Although some industrial representatives argue that it is less efficient to control emissions in clean areas, this has not been documented. In several RACT II categories, it is more cost-efficient on a dollars-per-ton basis for emission sources in attainment areas to control emissions than it is for emission sources in the same category in NAA. (See EcIS, Table I, p. xii; Table 3.12, p. 66; p. 95.) It is notable that attainment areas produce almost one-third of the VOM emissions and potential emission reductions in the state. Thus, attainment areas, as a whole, are not insignificant VOM contributors. In fact, in many cases, the largest VOM emitters are located in attainment areas. The argument that controls are not cost-beneficial in attainment areas (R.552) overlooks the transport phenomena and its impact on surrounding areas. In the absence of documentation as to the source of hydrocarbons contributing to ozone problems, it is impossible to determine the cost effectiveness of controls simply on the basis of the lack of an ozone problem in the county in which the emission source is located. The Board also notes proposed federal amendments to the Federal Motor Vehicle Control Program suggest that it would be imprudent to rely on that program to insure maintenance of a margin for growth.

There is no basis in the record for concluding that Illinois industries will be at a competitive disadvantage vis-a-vis industries located in states which have adopted RACT only in NAA. In fact, the major industrial states of California, New Jersey, Massachusetts, South Carolina, Michigan, Ohio, and Pennsylvania have all adopted RACT controls on a statewide basis. (R. 847.) On the contrary, a competitive disadvantage will accrue to Illinois industries located in NAA vis-a-vis Illinois industries located outside NAA if RACT is not applied statewide. The competitive disadvantage would be increased for businesses in NAA's in that various exemptions and extensions for industries in RACT II categories would have to be eliminated to accommodate for increased pollutant background levels. These Illinois industries would not only be at a competitive disadvantage within Illinois but also vis-a-vis their counterparts elsewhere.

The Board also notes that the constant shifting of regulatory requirements which would result if RACT were applied only in NAA is counter-productive to pollution control decision-making both in business and government. The long-range planning perspective necessary to make investments and plan growth will not benefit from additional uncertainty.

III. Proposal to Exempt Particular Solvent

On May 30, 1980 De Soto, Inc., Midland Division, the Dexter Corp., and International Harvester Co. petitioned the Board to amend the definition of Volatile Organic Matter (VOM) by adding 1,1,1 - Trichloroethane and Methylene Chloride to the list of solvents which are exempt from the definition of VOM. (Ex. 31; P.C. 3.) The Board consolidated this proposal with the R80-5 proceeding. These two solvents can be a compliance alternative for some surface coating operations.

There was significant debate in the record on the exemption of these solvents. Participants and commentors generally agreed that these solvents do not appreciably contribute to ozone formation and are only negligibly photochemically reactive. Thus, they are not to be regulated as ozone precursors. However, there was disagreement as to other health effects and depletion of the stratospheric ozone layer (6 miles above the earth). (R. 701-751; 409-425; 1401-1446.) These identical issues were considered in the RACT I proceeding in which the Board decided that an exemption was unwarranted due to the fact that these solvents had not been well tested for their toxicological properties. (R. 79-3,4, Opinion of the Board, pp. 11-13.)

After a careful review of the record created in this proceeding the Board finds that recent studies show that there is insufficient evidence to justify regulating these solvents for possible health effects.

First, the Board notes that the OSHA standards, which anticipate eight-hour workplace exposure to the solvents, are 350 ppm for these solvents in contrast to 10 ppm for carbon tetrachloride, a known human carcinogen. It is also notable that USEPA has declined to place these solvents on its Potential Atmospheric Carcinogens list. (R. 720.) Following 29 tests of mutagenicity, the National Toxicology Program concluded that 1,1,1 - Trichloroethane was a non-carcinogen. (R. 721.) Similarly, the Science Advisory Board found that there was no evidence to suggest that either solvent may be carcinogenic. (R. 721.) Another report prepared by BDM for the U.S. Army states that chronic exposure studies suggest that these solvents are not carcinogenic and cause no damage to vital organs when concentrations are maintained within recommended exposure limits. (P.C. 22, Attachment.)

Although it is extremely difficult to conclusively prove that a substance is absolutely safe, the Board must conclude in light of this evidence that these solvents have not been proven to be more dangerous than many other unregulated substances. The evidence on damage to the stratospheric ozone layer caused by these solvents is also inconclusive. Thus, finding that continued regulation is not justified on any of these bases, the Board has amended the definition of VOM as proposed.

IV. Rotogravure and Flexography - Rule 205(s)

A. General Technical and Economic Issues

In the "Graphic Arts - Rotogravure and Flexography" category, emission reductions can be achieved either by 1) adding on a carbon adsorption control system, 2) adding on an incineration control system, or 3) switching to low solvent inks. The proposed rule provides that use of any of these three alternatives will constitute RACT provided that certain reduction efficiencies are achieved.

The use of low solvent inks which are either water borne or high solids is the preferred technology because it is the least material and energy intensive, as well as the least expensive, alternative. However, water borne inks which are currently available do not meet all printing requirements. The USEPA CTG for this category indicates that water borne inks are used extensively for printing on heavy paper materials, but are not used on thin paper stock because the higher water content weakens the paper. (Ex. 9, p. 3-9.) To encourage development of more widely usable low solvent inks, USEPA has indicated that they will accept an extension of the compliance date beyond December 31, 1982 for sources which are making good faith efforts to develop low solvent ink systems. (Rhoad's Memo, Group Ex. 20.) The Flexible Packaging Association of Illinois testified that with this compliance date

extension, their members should be able to bring low solvent inks on line. (R. 279.)

The USEPA CTG and the IEPA proposal recommended that printing presses using water borne inks consisting of 75% or more of water and 25% or less of organic solvent by volume should be considered RACT. At these volumes, emission reductions equivalent to those expected from the add-on treatment system should be achieved. USEPA and IEPA also recommend that inks which contain 60% or more non-volatile material be considered RACT in order to encourage development of high solids inks.

The CTG states that carbon adsorption and incineration systems have a reduction efficiency of 90% of the VOC delivered to them. However, the efficiency of the capture systems, such as hooding, which are required to deliver the emissions to the adsorber or incinerator, varies with the type of printing operation. Reported combined capture and reduction efficiencies for publication rotogravure plants have been 75% or more. (CTG, Ex. 9, p. 1-2.) Large packaging rotogravure presses are expected to have less capture efficiency due to the fact that they generally have shorter runs, a greater variety of solvents, and more dilute solutions. (R. 782.) An overall control efficiency of approximately 65% is considered achievable for these presses. (CTG, Ex. 9, p. 1-2, R.999, 1014-15.) Due to the construction of flexographic presses, effective hooding and ducting is difficult to construct. Therefore, a lower overall control of efficiency of 60% is considered to be RACT for flexographic presses. (CTG, Ex. 9, p. 1-3.) While at least one witness argued that there was no basis given in the CTG or TSD for the 65% reduction from packaging rotogravure presses (See Ex. 24; R. 1014), several other witnesses representing the Illinois printing industry indicated that these numbers were achievable. (See Ex. 24; R. 279-80, 444-446, 779, 780.)

Although the retro-fit systems are technologically available, they may not be economically reasonable in all cases. The cost effectiveness of both systems depends on the amount of ink used by the source and the VOC concentration by volume in the emissions gas stream. For example, witnesses testified that both incineration and carbon adsorption systems are expensive for packaging rotogravure presses which are characterized by short runs, dilute levels of solvent, and varied solvent mixtures. Carbon adsorption systems are considered more cost effective for publication rotogravure than incineration due to lower operating costs and the fact that solvent can be recovered for reuse with this system. USEPA found that a carbon adsorber used by a publication rotogravure press will have a negative annualized cost if a plant uses at least 7,720 tons of ink paper per year at a VOC concentration of 2,400 ppm. At 3,860 TPY, the same plant would spend only 63 cents per ton for the carbon adsorption system reductions. (CTG, Ex. 9, Table 4-10.)

USEPA recommends that plants using less than 100 TPY of ink be exempt from RACT requirements. (R. 132, CTG, Ex. 9, Fig. 4-4, 4-5.) This exemption is based on the drastic reduction in cost effectiveness per ton of emissions for plants using less than 100 TPY of ink. An exemption at this level will yield 95.9% of all emission reductions possible in this category in Illinois. (R. 164.) IEPA argues that this variation from the USEPA guidance should be acceptable to USEPA because it is within the "5% deviation rule."

The economic impact study (EcIS) focused on costs for the four companies which would be subject to additional controls if the 1000 TPY exemption were utilized. Two of these are packaging rotogravure and two are publication rotogravure. The EcIS compared company-provided cost estimates based on retrofitting. However, the larger of the packaging rotogravure firms indicated it could convert to low solvent inks if it were given a compliance date extension beyond 1982. Although the EcIS does not provide cost estimates for conversion to low solvent inks, the Agency's economic study found this to be the most economical alternative in the long run due to the fact that low solvent inks are less expensive than high solvent inks and minimal retrofitting would be required. For publication rotogravure, one company indicated that it is currently operating one carbon adsorber and plans to put four more on line. The company indicated that the expected payback period based on recovered solvents is three years. (EcIS, p. 44; P.C. 18.)

The EcIS found a cost effectiveness of \$27.50 TPY for publication rotogravure (carbon adsorption) and \$283.20 TPY for packaging rotogravure (incineration). The combined cost efficiency was estimated to be \$116.7 TPY for retrofitting in this category. As noted, costs and savings associated with conversion to low solvent inks were not quantified and are expected to be lower.

The Printing Industry of Illinois Association stated that the IEPA's proposal is "basically an excellent document." The Flexible Packaging Association stated that the proposal was "reasonable" within the meaning of the Clean Air Act. However, the associations requested the following revisions: 1) a clarification that "proof presses" are not covered by RACT requirements; 2) a rewording of Section 205(s)(1)(B) to avoid confusion; 3) the provision of an optional compliance date extension for companies committing to conversion to low solvent inks; and 4) the provision of a "bubble" option.

B. Specific Issues

Rule 205(m)(b) allows an extension of the compliance date up to 1987 consistent with the conditions specified in the rule which

generally reflect the Rhoad's Memo. This provision is included in the rule as an incentive for the development of low solvent ink technology and also to avoid the submission of numerous duplicative variance petitions.

Rule 205(s)(1)(C) and (D) utilized the control and capture efficiencies proposed by the Agency. As stated above, the proposed 65% capture efficiency for packaging rotogravure was questioned by one company, however, there is no indication in the record that this capture efficiency is not generally achievable in the industry. The Board notes that the 65% capture requirement is established in consideration of the fact that capture efficiency is lower for packaging rotogravure than for publication rotogravure. Any special hardship which may be experienced by an individual company may be the appropriate subject of an individual variance from this rule.

Rule 205(s)(2) utilizes the 1000 TPY exemption proposed by the Agency. This exemption is justified by the fact that in Illinois this industry is characterized by large plants which make up the bulk (95.9%) of the available emission reductions. (R. 1000-1005.) Regulation of smaller businesses for which the purchase of retrofit equipment or the experimentation with low solvent inks is far less cost efficient is not justified at this time. The Board notes that the Agency proposal used the term "facility," but did not define this term. The Board proposal uses the term "press" to achieve consistency. However, the Board proposal is intended to reflect the same exemption levels which were proposed by the Agency. The Board specifically solicits comment and definitional proposals on this point.

Given the 1000 TPY exemption, there is no need for a special exemption for "proof presses" as was suggested by the trade associations. The argument for the proof press exemption was based on the fact that proof presses are very small emission sources. The Board also declines to create a new definition of "printing press" as proposed by the trade associations due to the lack of a sufficient discussion of the impact of such a definition in the record.

Several witnesses expressed interest in utilizing a "bubble" approach to achieve emission reductions equivalent to those achievable utilizing the specific technology prescribed by this rule. The Board notes that the provisions of the recently adopted Chapter 2, Part 212, Alternative Control Strategy rules will allow an owner or operator of a press subject to this rule to demonstrate the equivalency of an alternative approach.

V. Leaks from Petroleum Refinery Equipment - Rule 205(e)

A. General Technical and Economic Issues

In the "Leaks from Petroleum Refinery Equipment" category, it is recognized that an inspection and maintenance program can reduce VOM emissions and save petroleum. The emission reduction expected from application of the Agency proposal was approximately 31,000 TPY. This is the largest single category of emission reductions addressed by the RACT regulations, as well as the most cost efficient to control. The Economic Impact Study found that the estimated savings of crude oil to refineries in Illinois more than offset the cost of the inspection and maintenance program proposed by these regulations. While the Agency and the EcIS used a 90.2% control efficiency in calculating reductions expected from inspection and maintenance, the authors of the EcIS found that the level of control efficiency at which petroleum savings equals annual control costs is only 19.4%.

The issue in this category is not whether inspection and maintenance is RACT, because, for the category as a whole, it is clearly available and economically reasonable. The issue is what frequencies and methods of inspection and maintenance are most cost efficient. The Illinois Petroleum Council (IPC) presented a lengthy analysis of the proposed rule focusing on the cost effectiveness of monitoring particular types of components in particular types of service (gaseous, liquid, and heavy liquid).

Cost effectiveness does vary component by component. For example, a model refinery is presumed to have 100,000 leaks. 75% of these leaks are presumed to be attributable to pipeline valves, while only 5% are attributable to pump seals. However, the Petroleum Council testified that 63% of the maintenance costs are associated with monitoring pump seals. Among other things, the Petroleum Council proposed an exemption for components in heavy liquid service, an exemption for pump seals and flanges, an exemption for gas streams containing less than 30% VOM, monitoring only during the ozone season, deletion of the reporting requirements, and a reduction in the monitoring periods. (See R. 621-635.)

B. Specific Issues

The Board rule reflects a number of the concerns expressed by the IPC, yet retains the bulk of the emission reductions predicted to be available from this category during the ozone season. In addition, the rule has been somewhat reorganized to more clearly identify the actions that are required of owners and operators.

First, the definition of "component" in Rule 201 specifies particular components but also retains the phrase "but not limited to" in order to insure that any leaking piece of equipment will be monitored, reported, and repaired. The language has been amended, however, to specifically exclude all "equipment" in "heavy liquid service." The rationale for excluding valves in heavy liquid service, as originally proposed, applies equally to other components, that is, liquids with very low vapor pressures do not evaporate and leak in significant amounts. To clear up an ambiguity raised in the record, the Board notes that all valves which are not externally regulated and all flanges are excluded from the definition of component.

The proper definition of "Heavy Liquid" was debated in the record. The record revealed some ambiguity as to whether the Agency was proposing a maximum vapor pressure of 0.011 or 0.11 at 70°F. The IPC argued that the 0.011 at 70°F was unreasonable, and could not be conveniently translated into current refinery test practices which use Reid vapor pressure. The IPC proposed 0.1 Reid vapor pressure which translates into a true vapor pressure of 0.04 psia at 70°F. In a supplemental comment, the Agency concurred in this proposal. A review of the vapor pressures of various petroleum products indicated that this change would not enlarge the category of products considered to be in heavy liquid service, and that it would properly distinguish products with very low rates of emission. Therefore, the Board rule utilizes the true vapor pressure of 0.04 psia at 70°F. In addition, a boiling point criteria has been added in response to comments and to insure consistency with the federal definition.

Rule 205(1)(4) contains a general statement of the requirements applicable to petroleum refineries. The information to be contained in the monitoring program plan is specified in Rule 205(1)(5). Notably, the specific tagging requirements which were proposed have been replaced with the more flexible requirement that the plan include a description of the method used to mark various components.

The monitoring program (Rule 205(1)(6)) requires monitoring only twice a year, before and during the ozone season. The limitation to the ozone season is justified by the fact that outdoor inspection and maintenance of this equipment is particularly difficult in the winter in Illinois and emissions during the colder winter months do not pose an ozone threat in Illinois and the Northeastern United States. The annual testing of components must be completed and reports filed prior to May 1st of each year. Although the rule allows flexibility with regard to when the monitoring is actually performed, it is anticipated that the monitoring would take place within two or three months preceding May 1st. Testing must be performed again and reports filed again prior to August 1st of each year for certain specified components.

The proposed Agency authority to require early turn-around of leaking components has been deleted. The Board questions both the legality and the policy implications of such an authorization. However, to insure that problem components receive the attention necessary to minimize leaking, Rule 205(1)(6)(C) authorizes the Agency to require more frequent monitoring for components which have been documented as having a history of leaking. The burden of proving such a history has been documented will be on the Agency.

The proposed Agency authority to generally modify the requirements in the Board rules has been deleted because this delegates rulemaking authority to the Agency without proper standards. Nonetheless, the Board recognizes that experience gained in carrying out the monitoring program should enable owners and operators to distinguish more and less frequent leakers. Thus, it is desirable to have flexibility in the rules to adapt the monitoring, recordkeeping and reporting requirements to the needs of each refinery. Rule 205(1)(9) provides this flexibility if the owner or operator can demonstrate that an alternative program will provide an equivalent inspection and maintenance capability. This mechanism resembles a "bubble" approach to refinery leaks, however, use of the recently adopted Chapter 2 Alternative Control Strategy Rules would be an unusually complicated approach to "netting" the thousands of small refinery leaks. The "equivalency" demonstration required by this specialized rule is the equivalency of the ability to identify and repair leaks, rather than an equivalency of emissions, which would be extremely burdensome to quantify.

The rule does not include an exemption for gaseous streams containing less than 30% VOM as proposed by the IPC. Notably, the Radian Study indicates that an 85-95% emission reduction can be achieved by controlling components in hydrogen service. Also, no accurate count of the number of units affected nor the particular hardship involved in monitoring these units was given in the record.

Rule 205(m)(4) requires that the monitoring program plan be submitted to the Agency within six months after the effective date of this regulation and that the first annual monitoring report be submitted prior to May 1, 1982. It is anticipated that this time-frame will enable refineries to put together a plan, perform the first monitoring program, and report to the Agency prior to the beginning of the 1983 ozone season but no later than May 1, 1983.

On a related issue, the Agency proposal amended the definition of VOM to eliminate the specialized definition of VOM adopted for Rule (1)(1-3) in the RACT I proceeding. Nothing in the Statement of Reasons or the record explains the purpose of this amendment, therefore, the 1.5 psia definition applicable to those RACT I categories has been retained.

VI. Surface Coating of Miscellaneous Parts

A. General Technical and Economic Issues

This CTG category encompasses a wide variety of metal products such as combines, tractors, lawn mowers, mixers, typewriters, pumps, fans and metal door frames. Nearly all manufactured metal parts and products not presently covered by Rule 205(n) (RACT I) are included under the new proposed rule. Although 268 Illinois companies fall within the SIC categories subject to this CTG, those that emit less than 25 tons per year are exempt under existing Rule 205(n)(3). With this exception, 145 companies would be affected.

USEPA has recognized six applicable control technologies for the surface coating of miscellaneous metals: water borne coatings without electro-deposition, higher solids coatings, powder coatings, the use of a carbon adsorber, and the use of an afterburner. The total uncontrolled emissions from Illinois companies in this category is 33,870 tons per year. By application of the Agency proposal, IEPA predicted that emissions can be reduced by 24,494 tons.

The Agency proposed compliance paint specifications for the Miscellaneous Metals category in general. However, there was a great deal of debate in the record as to the applicability of these paints to the specialized requirements of heavy-duty, off-road vehicles, such as tractors and trains, and to outboard marine equipment. Both the size and endurance requirements of this equipment create special problems. Extensive testimony was offered at the hearings by Illinois manufacturers on the lack of proof of the availability of water-based, high-solids and powder coatings for their products. All of these companies have run tests and found varying degrees of success in the application of various compliance paints. Chipping and running of the paints were experienced in some trial runs. Because of the size of the equipment involved and the Illinois climate, prolonged air drying times or the need to construct giant dryers and warehouse drying space for water-based paints is considered prohibitively expensive. Although one paint company and the Agency argued that compliance paints have been successfully tested and are available, these arguments were based on a limited number of trial runs and even fewer instances of actual production use for this type of equipment. (R. 1054-99.)

Caterpillar Tractor (CAT) proposed that a separate category be established for off-road, heavy-duty vehicles for which higher solvent coatings would be accepted as RACT. (R. 349-50.) A similar proposal was made by G.M. Electromotive for Diesel-Electric Locomotives. (P.C. 28, p. 4.) With regard to automobile coatings, a recent USEPA policy statement (Exhibit 55) generally recognizes that the CTG prescribed compliance paints have not yet been fully

commercialized for top coat operations and recommends postponing final compliance dates to the end of 1986 to encourage development of high solids and water-borne coating development. These problems are similar to those faced by the heavy-duty, off-road vehicle and locomotive industries.

Outboard Marine Corporation (OMC) testified that some of their products, which include marine propulsion devices and off-shore drilling equipment, are subject to unique salt-water and corrosive environments which make it impossible to meet either the general or extreme performance coatings specifications. (R. 304-332.) A witness representing a major paint supplier confirmed that for the "very specialized high temperature resistant coatings" required for outboard marine products there is "no possibility of any high temperature coatings technology coming to bear, at least in the next eight to ten years." (R. 1094-5.) OMC argued that the exemption proposed by the Agency and USEPA for this category, "the exterior of marine vessels," was ambiguous with regard to the "exposed propulsion equipment" which they manufacture.

Although improved transfer efficiency is recognized as a means of reducing emissions, neither USEPA nor the Agency define upgraded transfer efficiency as RACT. However, a company considering such a strategy would have the opportunity to demonstrate that their system provided equivalent control under existing Rule 205(n)(2)(B).

In addition, a great deal of testimony was received, largely from paint suppliers, indicating that paints using the solvents 1,1,1 trichloroethane and dichloromethane would provide a compliance alternative for certain surface coaters in the Miscellaneous Metals category.

The Economic Impact Study predicted that the costs of compliance in this category range between \$1,434.7 in Non-attainment counties to \$1,032.0 in Attainment counties. (See EcIS, p. 66, Table 3.12.) The costs are based on 93% of the affected sources switching to high-solids or water-borne coatings and 7% retrofitting with incineration units. The EcIS notes that 41.4% of the total annual costs are associated with incineration and that this cost will be lower if the two non-exempt solvents are made available to companies which cannot use other compliance coatings.

B. Specific Issues

In response to the evidence presented by several Illinois industries as to the non-availability of the proposed compliance options contained in the the Agency proposal for the highly specialized manufacture of Heavy, Off-Highway Vehicles and Diesel-Electric Locomotives, separate categories have been created for these coating lines. These new categories are defined in Rule

201 and compliance coating specifications for each category are listed in Rule 205(n)(1)(K) and (L). In addition, based on evidence in the record and USEPA findings that extreme performance top coats for air-dried coating lines will not come on line for production uses until the end of 1986, the final compliance date for these particular coating lines may be extended to no later than December 31, 1986 if the requirements of Rule 205(m)(5) are met. Other coating lines in the Miscellaneous Metals category must comply with the compliance date in Rule 205(j), that is, December 31, 1983.

In response to testimony on the lack of availability in the foreseeable future of compliance coatings for either "the exterior of marine vessels" or "marine propulsion equipment," these particular surface coating operations are exempted from the definition of Miscellaneous Metal Parts and Products in Rule 201. Although the Agency testified that further definition of the term "exterior of marine vessel" would be a preferable approach, no such definition was proposed. The explicit reference to propulsion equipment is added to minimize the ambiguity on this term.

The Board also notes that the exemption of the 1,1,1 trichloroethane and methylene chloride will reduce the economic impact of the proposed regulation on industries in this category.

VII. Petroleum Liquid Storage in External Floating Roof Tanks

A. General Technical and Economic Issues

Existing Rule 205(a)(2)(A) requires petroleum storage tanks in Illinois equipped with floating roofs to use a "primary seal" around the rim to close the space between the roof edge and tank wall. The Agency proposal recommended retrofitting these roofs with an additional "secondary seal" to reduce wind-induced evaporation as RACT. For tanks containing gasoline, secondary seals have been shown to provide a 97.8% control efficiency. An IPC survey identified 362 tanks which would require retrofitting under this rule. (R. 609, Also see Ex. 26.) The total uncontrolled emissions from this category are 17,300 TPY. The Agency predicted their proposal would reduce emissions by 77%.

Existing Rule 205(o)(3) generally prescribes requirements applicable to all petroleum storage tanks. The Agency proposal, as amended, recommended a "clean-up" of Rule 205(a)(3)(A) and the addition of Rule 205(a)(3)(C) containing additional specialized requirements for external floating roofs, including a secondary seal, "gap" limitations, and semi-annual inspections. New Rule 205(a)(3)(D) provides exemptions to Rule 205(o)(3)(C) for certain types of tanks equipped with alternative control devices and for tanks used to store waxy, heavy pour crude oil.

Although retrofitting petroleum storage tanks is technically achievable, technical debate in the record focused on the efficiency of the secondary seal requirements for certain petroleum, the equivalence of other seals, and the feasibility of maintaining zero gap between the tank and the seal.

The IPC argued that deposition on the tank wall in tanks containing waxy, heavy pour crude oil would render a secondary seal inoperative (Ex. 29A and B, R. 685-687.) The IPC presented extensive evidence on parameters of waxy, heavy crude oils which were not contained in the Agency proposal. The Agency proposal focused only on crude oils with a "pour point" of 50°F. IPC recommended a "pour point" of 10° F, a paraffin content test, and a viscosity test all be available as alternative tests for identifying crude oils which form waxy, heavy deposits. The evidence presented by the IPC was not rebutted and thus the Board presumes that the rationale for exempting crudes which leave a deposit on the tank wall also applies to crudes identified by these additional tests.

The IPC also argued that the equivalency of various other seals should be defined as RACT by the Board. The Agency responded that they have identified several equivalent seals and that Rule 205(o)(3)(D)(iii) will provide them with an opportunity to review and approve additional seals.

Industry testified that "zero gap" is not achievable on a continuous basis, and that generally a 1/8 inch gap for 95% of the circumference and 1/2 inch gap for the remaining 5% should be considered RACT in order to avoid recurring technical violations of the standard. The Agency proposal would allow an accumulated area of gaps exceeding 1/8 inch in width equal to 1.0 inch² per foot of tank diameter.

IPC also argued that the semi-annual inspection was not required by the Federal CTG and that annual inspections were existing industry practice.

The Agency and the IPC concur that the retrofitting costs per tank are approximately \$20,625. (R. 609.) The Economic Impact Study found a somewhat higher capital cost plus annual control costs of \$5,900. However, the Economic Impact Study originally also found that there would be an annual petroleum credit from saving 5 million gallons of gasoline annually which would totally off-set all costs associated with the Agency proposal. The control efficiency utilized in the study yielding the high petroleum savings was disputed by the IPC, particularly with regard to crude oil tanks which have a lower emission rate. There was also a debate on the proper emission factors to be used. The authors of the study revised their findings on the basis of USEPA's revised emission factors (AP-42, 4/81 Revision) and found a smaller emission reduction and petroleum credit for crude oil

tanks, resulting in a cost/effectiveness ratio of \$2,255.8-2,334.8 per ton. The combined cost/effectiveness for gasoline and crude tanks in Illinois was revised to \$24.1-453.3 per ton. Costs in Attainment areas, though less than in Non-attainment areas on a per ton basis, are higher overall due to the location of a greater number of crude tanks in Attainment areas.

The costs associated with crude oil tanks must be reduced by the number of tanks which will not be required to retrofit due to the heavy, waxy pour crude oil exemption. For example, utilizing the industry proposed definition of heavy, waxy pour crude, Marathon Oil Company testified it will be required to retrofit only 3 of its 44 crude oil tanks in Illinois. Under the Agency definition, 27 crude tanks would require retrofitting.

B. Specific Issues

The Board rule largely incorporates the definition of "Waxy, Heavy Pour Crude Oil" proposed by the IPC. This broader definition is supported both by the technical problems associated with deposition from these crudes and the lower cost effectiveness and control efficiency of secondary seals on crude tanks. The rule, however, utilizes the 50° F pour point proposed by the Agency rather than the 10° pour point. Without additional documentation on deposition at various pour points, the Board declines to alter the Agency proposal on this point.

The Board rule adopts the Agency's proposed gap rule allowing 1/8 inch gap equal to 1.0 inch² per foot of tank diameter. This is not a zero gap policy, but provides a uniform standard which is somewhat narrower than the IPC proposal.

The semi-annual inspection proposal has been modified to a single inspection to take place prior to May 1st of each year. The seal gap should be inspected at this time also. The May 1st date is geared to the beginning of the ozone season in Illinois, and, to be most effective, it is anticipated that inspections will take place within the months immediately preceding this date.

The Board agrees with the Agency that the equivalency of other seals may be determined by the Agency pursuant to Rule 205(o)(3)(D)(iii).

VIII. Perchloroethylene Dry Cleaning

A. General Technical and Economic Issues

For commercial and industrial cleaners, under the Agency proposal RACT technology is carbon adsorption plus certain work practices. Coin-operated cleaners need only comply with the work practice requirements. The carbon adsorption systems are technically available and in wide use among large dry cleaners due to

the fact that it is economical to capture and re-use the solvent. The capital cost for this system at a "model" commercial plant is estimated to be approximately \$5,500 or \$1,400 annually. Estimated solvent recovery valued at \$2,100 annually would create a \$700 annual gain. Comparable, though larger, figures are estimated for industrial plants. Notably, however, the EcIS found the cost effectiveness of the proposed work practices for coin-operated plants was \$2,333 per ton of emissions.

The total VOC emission reductions estimated to be available from this category under IEPA's proposal are 2,100 TPY. Approximately 1,600 commercial, industrial and coin operated dry cleaners could be affected by these regulations. IEPA has permit information for only 115 of these. Average VOC emissions for a permitted facility without controls are estimated to be 7 TPY.

The Illinois Fabricare Association testified that many of the commercial dry cleaners in Illinois are far smaller than the USEPA model plant and use less solvent. Thus, their "payback" on recycled solvent is smaller and the initial capital expenditure is more burdensome.

Among other things, the Fabricare Association recommended exemption for small dry cleaners using less than 30 gallons per month and that alternatives to the IEPA proposal be made available for the draining and drying of filtration cartridges.

B. Specific Issues

Given the small amount of emissions produced by each plant and the difficulty of enforcing regulations with regard to many small plants, the Board rule adopts the Fabricare Association's recommended 30 gallons per month exemption level. In doing so, the Board notes that many of these small dry cleaners are within the purview of the recently adopted Illinois Regulatory Flexibility Act which mandates special regulatory consideration for small businesses. Testimony in the record indicated that many of these operations employ under 10 people and have an annual net profit of less than \$3,000. While these small operations are exempt from the carbon adsorption requirement and the permit requirements, they must comply with the work practice requirements.

Other changes have been made in the Agency proposal to provide additional flexibility in the work practices and emission reduction requirements while retaining equivalent environmental protection.

IX. Pneumatic Rubber Tires

A. General Technical and Economic Issues

Four manufacturing processes are addressed in this category: undertread cementing, tread end cementing, bead dipping, and green tire spraying. Carbon adsorption or incineration retrofitting is technically available for all four processes. A capture system is also required. Water-based coatings, as a substitute for solvents, are also available for green tire spraying.

Two Illinois plants will be affected by the undertread requirement. Carbon adsorption with solvent recovery is the most economical alternative for this process with a cost effectiveness of \$312/ton of emission.

The "bead-dipping" process described in the CTG is apparently not used by any of the three Illinois plants. While the CTG process emits 8.2 grams per tire, the Illinois process emits 6.8 grams per tire. (P.C. 11, p. 6.)

The "tread-end cementing" process in the three Illinois plants is, at least largely, manual rather than automatic. Data on manual tread-end cementing indicates emissions lower than the CTG estimates of 15 grams per tire for automatic. There was agreement in the record that manual tread-end cementing should be considered equivalent to RACT.

Water-based coatings are considered most economical for green tire spraying. Two of the three Illinois pneumatic rubber tire plants already use water-based coatings and the third is planning to switch over to it. However, the tire manufacturers dispute the availability of 5% VOM coatings for the outside of tires. They testified that a substitute water-based coating for the normal solvent-based mold-release compound used on the outside of tires will require a 10% VOM content. The EcIS found the cost effectiveness of water-based paints to be \$236/ton of emission.

Representatives of the tire industry indicated that they would like to see a "net" per tire emission limitation of 59 grams, rather than process-by-process capture and reduction requirements.

The Agency proposal requires capture systems to have a minimum capture efficiency of 65%. USEPA has indicated they believe 85% capture efficiency represents RACT for the industry. However, the two Illinois tire plants having undertread cementing operations point out that the USEPA's reduction efficiency figures are based on the single carbon adsorption unit in operation in the country. They argue that even the model used did not achieve the CTG efficiency levels and that Illinois plants can be expected to achieve even less due to shorter residence times. (P.C. 11, p. 3.)

B. Specific Issues

It appears the Agency inadvertently included 20 inch tires in the rule by use of the phrase "up to 20.0 inches." These tires are considered heavy-duty truck tires and are not included in the CTG. (Ex. 21; pp. 11-12.) Goodyear and Firestone suggested "up to, but not including" 20 inch tires as the appropriate cut-off point. To clarify this, the definition of Pneumatic Rubber Tire Manufacture has been modified to exclude 20 inch tires.

New Rule 205(t)(3) has been added to allow the use of different approaches to any of the regulated processes which can be demonstrated to be equivalent on the basis of VOM emitted. This will mean that manual tread-end cementing and the existing Illinois bead-dipping process will meet RACT requirements. The Board declines to create a specialized "bubble" rule for this category. However, a "grams-per-tire" proposal covering multiple processes would be allowed under the Board's recently adopted Alternative Control Strategy rules.

X. Synthesized Pharmaceuticals

A. General Technical and Economic Issues

Emission reductions available by application of RACT II in the synthesized pharmaceuticals category represent one-half of one percent of the total emission reductions believed to be available in Illinois, or 300 TPY. (See EcIS, Table 3.19, p. 81.) Although USEPA identified 40 pharmaceutical plants in Illinois, only five of these plants synthesize pharmaceuticals. Each plant may contain a number of different sources of VOC emissions, but IEPA found that only four point sources, reactors, centrifuges, crystallizers, and dryers have the potential to emit greater than 15 pounds per day. IEPA has proposed to exempt sources with the potential to emit less than 15 pounds per day. Retrofitting the remaining sources with condensers, scrubbers, or carbon adsorbers is considered RACT by USEPA. (Ex. 6.)

While it is technically feasible to achieve a 90% reduction in emissions from these point sources by retrofitting, it is not cost efficient due to the small rate of emissions. The EcIS estimated a cost effectiveness of \$8,092.60 per ton for this category. (See EcIS, Table 3.19, p. 81.)

B. Specific Issues

The Board finds that application of the recommended retrofit technology is not economically reasonable for Illinois plants in this category due to the insignificant level of emissions which would be captured and the expense of the equipment involved.

XI. Compliance Dates

Many of the compliance dates originally proposed by the Agency have become outdated in the course of this rulemaking. Rule 205(j) adopts December 31, 1983 as the final compliance date for Rule 205(n)(1)(J), (K) and (L), Rule 205(o)(3), Rule 205(s), Rule 205(t), and Rule 205(u)(1)(A)-(C). This deadline is designed to provide sufficient time after promulgation of the rule for internal planning decisions, equipment design, any necessary agency approvals, delivery, installation and "debugging."

Rule 205(m)(4), (5) and (6) establish special plan submittal and compliance dates for petroleum leak monitoring, low-solvent top coating development programs for Heavy, Off-Highway Vehicle Products and Diesel-Electric Locomotive Products, and low-solvent ink developments programs. It is anticipated that petroleum monitoring programs will be carried out for the 1983 ozone season. The low-solvent coating and ink development programs are eligible for an extension of the compliance deadline until 1986 and 1987, respectively, if the compliance plan provisions and other commitments are met.


The deadline for implementation of dry cleaner work practices meeting the requirements of Rule 205(u)(1)(D)-(G) is December 31, 1982. This should allow several months for planning as well as purchasing and hiring if these are found to be necessary.

The deadlines for submittal of compliance plans for emission sources subject to Rule 104(h) are adopted as proposed by the Agency. Since these dates are based on a certain time period after promulgation of the rule, changes were not necessary. Rule 104(a), addressing the requirement of a compliance plan for emission sources not in compliance, has been reworded to improve clarity.

It should be noted that compliance plan submittal dates for the low solvent development programs listed in Rules 205(m)(5) and (6) are December 31, 1983. These later submittal dates are adopted in recognition of the fact that commitments to be made in the plans will require significant study. In particular, if planned reductions do not occur by an interim date for emission sources utilizing the low-solvent ink programs, retrofit technology must be implemented. (See Rule 205(m)(6)(C).)

Board Member J. Dumelle concurred.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify that the above Proposed Opinion was adopted on the 27th day of May, 1982 by a vote of 5-0.


 Christan L. Moffett, Clerk
 Illinois Pollution Control Board