

vene for the limited purpose of challenging the Company's motion to dismiss. By Opinion and Order of the Board entered on March 17, 1971, the Company's Motion to Dismiss was denied.

Subsequent thereto, approximately thirty hearings were conducted in the trial of the cause, principally in Granite City, with several hearings in Chicago beginning in May and suspending in September, 1971. The Agency's case in chief in support of the complaint was substantially completed but was interrupted in order to permit the testimony of Dr. Werner Eisenhut, a witness introduced on behalf of the Company from Essen, Germany, who, because of personal problems was permitted by agreement to testify out of sequence. The Agency's presentation, to the extent completed, consisted principally of testimony of various Agency employees, who testified as to their observations with respect to particulate emissions and Ringelmann violations emanating from the various facilities of the Company alleged to be in violation. A substantial number of photographs were offered into evidence.

Officials of the Granite City Air Pollution Control Board and several neighbors in the vicinity of the coke ovens and basic oxygen furnace also testified on behalf of the Agency to the alleged impact on the community resulting from the operation of these facilities. Several officials of Granite City Steel Company were called by the Agency as adverse witnesses. The testimony of Dr. Eisenhut, on behalf of the Company, related to the state of the arts of various abatement facilities being employed throughout the world in regard to charging, pushing and quenching inherent in the coking operation, which aspects of his testimony will be considered in more detail below.

In the fall of 1971, both sides represented to the Hearing Officer that they were in the process of formulating a settlement proposal pursuant to the terms of which the Company's steel-making processes would be brought into compliance with the relevant statutory and regulatory provisions relating to air pollution. Request was made that the hearings be suspended so that the prospect of settlement could be more fully explored.

A proposed stipulation and agreement was thereafter submitted to the Board, which, because of certain procedural aspects was not deemed acceptable. These objections were later removed by modification of the agreement which, as modified, was resubmitted to the Board. The Board directed the Hearing Officer to resume public hearings pursuant to Pollution Control Board Procedural Rule 333. Two additional days of hearings were conducted in Granite City limited to the elements of the proposed stipulation and agreement. After consideration of the transcripts and exhibits the Board, on April 25, 1972, entered its order approving and adopting the stipulation of settlement as the Order of the Board. The principal features of the Agreement will be considered below:

The Company agrees to establish a scholarship fund payable to the University of Illinois for studies related to environmental quality, through undergraduate and graduate college level disciplines, in the amount of \$150,000.00, to be administered by the President of the University of Illinois; \$50,000.00 is to be paid within seven days of the entry of the Order and an additional \$50,000.00 on or before January 2, 1973 and the balance by July 1, 1973.

The Company agrees to install and operate an AISI coke oven charging air quality control system on or before thirty months from the date of the Order, which installation is anticipated to cost approximately \$2,150,000. This facility is represented by various witnesses who constitute the most advanced state of the arts in the field of coke oven charging operations. Dr. Eisenhut testified that experimentation was presently being conducted with five types of pollution control devices used in the coke charging process. They were, first, Larry cars with wet scrubbers; second, gravity cars; third, Larry cars with steam Venturi scrubbers; fourth, the Redler Conveyor; and fifth, pipe line charging (R.3444-3491). It was his opinion that for adaptation to existing coking facilities, the gravity car with the AISI modifications would represent the best technology available and would abate charging emissions by 96% to 98%. Use of the gravity car would preclude the need for pre-ignition of charging gasses required when wet scrubbers were utilized, and would not possess the additional weight that has made the addition of other abatement devices on the car unsuitable. The gravity car would not employ a scrubber but is designed in a manner so that as the coal is charged from the car through the charging holes, the gases are sucked into a collecting main through the employment of steam vapor jets and at the same time, a temporary seal is formed at the point of entrance preventing the escape of gas at this location. The American car designed for use by the Company is an advanced version of the German car with improved closure mechanism and valving. Automatic lid-lifting devices are employed precluding the need for moving of the car before the lids are replaced. Plans and specifications for the AISI coal charging car are included in the record as Exhibits 84, 85 and 86. In addition, a leveling bar is utilized which prevents emissions from the leveling door. The cabin of the operator is air-conditioned. The entire operation is automatic, eliminating the need for any manual labor. Donald Cairns on behalf of the Company, described the operation as follows: (April 12, 1972, R.39).

"We have automatic onspot lidding of the ovens, that is the car comes up to the oven to be charged with the drop sleeves in place, the lids are removed magnetically, the drop sleeves fall into place, the coal is charged into the oven, and then any off gases of smoke which might evolve during charging are sucked over into the by-product main through steam, improved steam aspiration at the stand pipe. Then the charging sleeve is withdrawn, and the charging hole lid is replaced magnetically with this control."

The agreement provides for improved work rules with respect to the self-sealing doors on the coke ovens. These doors are self-closing and according to Dr. Eisenhut (R. 3515-19) there are no doors presently available that are better able to prevent emissions during coking. The knife-edged self-sealing doors appear superior to the back pressure doors that have been employed in Germany which minimize the amount of cleaning necessary but resulted in cracking of the oven walls. The work rules provided in the agreement require constant supervision, continuing door maintenance and prompt repair of any defective doors. Additional doors and separate alloy steel door seals will be kept on hand and refractories for lining doors will be maintained.

The Company agrees to install and operate a quench car water fogging system and prepare and maintain work rules and procedures relating to the system. This facility will be installed within six months from the date of the entry of the Order at an estimated cost of \$60,000.00. The fogging system is an interim operation and will be subject to review by the Board as set forth below. The evidence received at our recent hearings on control of air contaminant emissions (R 71-23) indicates that enclosed systems for control of emissions from pushing are commercially available. The regulation requires their installation by December 31, 1974 (Rule 203(d)(6) (B)(ii)(bb)). See opinion in the matter of emission standards, R 71-23, April 13, 1972, p. 24. Abatement equipment to control emissions from the pushing of coke is still in the developmental stage. Various types of hoods, both stationary and moveable, have been under experimentation in Germany, Japan and to some extent, in the United States (R. 3588-3635). Some metallurgical and wind problems have developed which must be resolved in the use of this facility. Also weight of the unit has created problems when attached to a moving charge car. The fogging system to be employed by the Company pursuant to the agreement is considered to be the best interim method for minimizing emissions from the pushing operation pending the improvement in the technology and reexamination by the Board. The system to be employed is similar to that used by the Zollverein Coke Plant in Essen (R. 3632-3635). Water is sprayed out of two sides of the quenching car onto the coke. The unit is considered to have a 50% efficiency and is considered more effective than the hood particularly since the system remains in operation during the movement of the car from the pushing position to the quench station. The fogging system is proposed as an interim method pending improved technology in this field. Paragraph 6 of the agreement, page 11, provides as follows:

"At the end of twelve and twenty-four months from the date of an Order of the Pollution Control Board approving this Stipulation, the Environmental Protection Agency shall, in consultation with Granite City Steel Company, evaluate (1) the effectiveness of the Water Fogging System, and (2) the state of technology of control of emissions from pushing of coke from coke ovens. The evaluation shall include a specific determination of the reasonableness of any alternative method of control, if

any, based on the state of technology, economic reasonableness and the emissions to be controlled.

If at the end of either twelve month period, the Environmental Protection Agency shall determine that the Fogging System is not as effective a control of pushing the coke from coke ovens as an alternative system or systems, based on the state of technology, economic reasonableness, and the emissions to be controlled, then the Environmental Protection Agency shall inform Granite City Steel Company and shall report to the Pollution Control Board the system or alternative systems which it determines should be installed and suggest a reasonable time schedule for installation. Determinations and evaluations of the Environmental Protection Agency may be submitted to the Pollution Control Board by either party for review and appropriate orders at the end of twelve or twenty-four months.

During said twelve month periods, the Environmental Protection Agency and Granite City Steel Company shall inform each other of improvements in the state of technology and may request discussions and exchange of information related to said improvements in the state of technology."

It will be seen from the foregoing that the Board reserves jurisdiction for such further orders as are appropriate in consideration of alternative systems which may develop over the next two-year period. Exhibit 87 in the record is a review of the state of the art on control of emissions from pushing coke, reviewing the various methods under experimentation including forms of hoods and continuous movement devices being developed throughout the world.

The Company agrees to install a quenching station baffle system within six months from the date of the entry of the Order at an estimated cost of \$130,000.00 which again is represented to be the most advanced state of the arts for this particular facility. Two systems have been used to abate emissions during the quenching operation. These have been the use of water jets and the use of baffles (R.3510-3512). The baffle system is considered a better form of emission control. The quenching tower designed for Granite City Steel Company is divided into three parts. A baffle consisting of wooden bars will be built into each part. Steam produced during the quenching will be unable to emit directly into the atmosphere but will be changed in direction by the bars in the baffle. As the dust-laden steam hits the baffles, the dust is removed from the steam. Water jets are installed to force soot downward, which is then flushed away into a settling basin.

The Company has already installed a smokeless excess blast furnace gas bleeder burner stack at an approximate cost of \$35,000, which prevents the emission of carbon monoxide built up in the blast furnace from entering the atmosphere and assures its burning without creating smoke in the process.

With respect to the sinter operation, the Company will install a Venturi Scrubber System on the Main Windbox, within 19-1/2 months from the date of the Order at a cost of \$1,200,000 designed to meet specified process weight rate values and in the alternative, if the operation cannot be controlled to meet the standards set forth, the sinter operation will be suspended until the standards specified are met. Control of the Main Windbox emissions as proposed will meet the recently adopted particulate emission standards for this facility (Sec.203(a) and 203(d)(2)).

The Company further agrees to install and operate a bag house cleaner on the sinter breaker process to be installed within sixty days from the later of the date of the entry of the order or the date the sinter process is next operated after the entry of the Order. This will likewise bring the breaker process into compliance with the new particulate regulation 203(a).

Surety bonds, each in the amount of the installation cost of each facility, respectively, in accordance with the terms of the agreement and payable on forfeiture to the Environmental Protection Agency are to be furnished, guaranteeing installation and performance of all of the facilities above provided. Forfeiture shall take place upon non-compliance with the terms of the agreement. The forms of bonds are incorporated in the stipulation and order of the Board.

Provision is made for inspection of all of the equipment and installations covered by the agreement. Compliance with particulate regulations shall be determined by procedures described in ASNE Power Test Code 27-1957 and results submitted to the Environmental Protection Agency.

The AISI Coke Oven Air Quality Control System shall be operated at the best attainable effectiveness using the best available technology and methods within its basic design capabilities as fabricated and installed in accordance with basic design drawings within 30 months. Determination of whether such operation does, in fact, meet these standards shall be determined in a proceeding before the Pollution Control Board. Provision is made in the Stipulation and Order for the authorization for inspection and investigation by the Agency and notification to the Company. The Company, during the entire period of the Agreement, shall continue a research and development program evaluating existing in-house pollution control equipment, investigate new technology and processes and program the installation of improved control equipment to comply with higher emission standards as required by law.

The Agreement further provides that during the time specified for the completion of the program, for each named facility, no enforcement action shall be brought pursuant to Sections 31(a) and (c) of the Environmental Protection Act for particulate air contaminant emissions beyond the limitations of the regulation applied to each facility, providing a variance of the Board or bond is then in effect.

Variances are provided for the following operations for the periods indicated:

Coke oven operation, including transporting coke to quench tower (except charging) for twelve months;

Quenching operations - six months;

Sinter breaker process stack - 60 days from the date of the Order or date of operation after Order, whichever is later;

Charging and any operation of which charging is considered a part - one year, with completion anticipated in thirty months;

Sinter process - main windbox - one year, with completion anticipated in 19-1/2 months.

The Company shall make application to the Board for desired extensions of variance beyond the original one-year allowance.

If the Company shows satisfactory progress to the Agency, extension of the variance shall be recommended by the Agency to the Board. For purposes of extending variance "satisfactory progress" as used in the Environmental Protection Act shall be substantial compliance with the program of installation as set forth in the Stipulation. Attached to the Stipulation as an exhibit is the proposed compliance program for each facility, respectively, together with work rules and operational procedures to be employed to assure compliance with all provisions of the Order.

In addition to the above facilities covered by variation with respect to which specific installations are to be made, work rules and operational procedures are embodied in the agreement for the basic oxygen furnace, the blooming mill, the hot strip mill and the steam generating facility for which no new installations are provided nor variances granted. Procedures to be employed in the event of upset and breakdown are included and details as to research development and reports are provided. Expenditures totaling in excess of \$4,000,000 will be made for installation of equipment to implement the abatement program and should be completed within thirty months from the date hereof.

The testimony of witnesses for the Environmental Protection Agency and the Company support the view that the proposed installations represent the most advanced state of the arts for abatement equipment and control of particulate emissions for each facility involved. Comparison between the specifics of emission control to be achieved by the equipment to be installed compared with the regulations for air

contaminant emissions recently adopted by the Board sustains the view that the Granite City Steel Company will be in compliance with the new regulations upon completion of contemplated installation program, although by reason of the variances allowed and anticipated, the dates of actual compliance may, in some instances, go beyond those expressly specified in the regulations. The testimony of Dr. Werner Eisenhut (R. pp. 3416-3912) supports the view that the installations proposed with respect to the coking operation and specifically, as to the charging by the AISI Larry car, the fogging mechanism to be employed during pushing, and the baffle system to be installed in the tower for quenching, represent the most advanced abatement facilities in the world at the present time.

Substantial testimony at the earlier hearings related to alternative means both employed and under consideration to control emissions from these operations, ~~none~~ of which appears to assure abatement in a more suitable form than those which are to be installed by the Company pursuant to this Agreement.

The Venturi Scrubber on the sinter process Main windbox and the bag house to be employed in the sinter breaker process again represent the best technology to achieve abatement from these sources. These views were confirmed by Adolph Biss, Metallurgical Specialist employed by the Division of Air Pollution, Illinois Environmental Protection Agency (R. April 12, 1972, page 85).

Dr. John Roberts, manager of the Air Pollution Control Division of the Illinois Environmental Protection Agency testified as follows: (R. April 12, 1972, p. 81)

"The improvement in air quality as a consequence of Granite City's proposed program is expected to be substantial. According to the Agency's calculations, comparing total emissions of particulate matter from the Granite City Steel facilities immediately prior to the filing of this suit in November of 1970 with emissions of particulate matter which are expected following completion of the proposed control program by the end of 1974, and assuming good housekeeping procedures, particulate emission can be estimated to decrease by over 90%. In terms of improvements in air quality in the Granite City area, this reduction in particulate emissions should lead to a corresponding reduction of approximately 90 micrograms per cubic meter in the annual geometric mean concentrations. What this means to the citizen of Granite City is that the average amount of particulate matter in the air will, after completion of this program, be cut approximately in half. In terms of health benefits to the citizen of Granite City this control program coupled with controls to be effected by other industries in the Granite City area as a consequence

of their compliance with applicable air pollution control regulations, will reduce air pollution levels to a safe margin below the national health-related standard. In terms of economic benefits, I can cite a study by I. Michelson and B. Tourin, '[Comparative Method for Studying Cost of Air Pollution.' Public Health Report. Vol. 81(6), pp. 505-511, June, 1966] concerning Upper Ohio River Valley in which a comparative analysis of annual per capita cleaning costs incurred in two cities (Steubenville with particulate levels comparable to those in Granite City in 1970 and Uniontown comparable but higher than those to be attained by 1975 in Granite City) showed a cost saving of \$84.00 per capita per year."

At the last public hearing in Granite City on the proposed agreement, some testimony was received regarding alleged excessive emissions from the stack of the basic oxygen furnace. No variation is sought for these facilities nor is any new abatement equipment required to be installed pursuant to the agreement and order. Electrostatic precipitators have been previously installed on the basic oxygen furnace and both the Agency and the Company represent that this equipment, plus the work rules, to be enforced, will assure compliance from this source. However, if such does not prove to be the case, the Agency is in no way foreclosed from taking such action as is appropriate to assure that this portion of the operation be brought into compliance if, in fact, it is not presently complying.

In the record are several statements from government officials, both state and municipal, and Southern Illinois University professors questioning whether the University of Illinois at Champaign is the appropriate recipient of the scholarship fund provided in the stipulation. The view expressed by these persons is that since the Metro-East Region has been the principal victim of the Company's past emissions, the money should be expended in the area affected and more particularly, at Southern Illinois University. While we are not without sympathy to this expression of attitude, we are satisfied that the University of Illinois, with its medical, engineering and law schools, in addition to its basic Liberal Arts and Science Programs is a suitable entity to carry out the objectives of the grant, particularly since the parties have agreed to this program as part of the overall settlement of the case, and we are not disposed to alter this provision.

The agreement in the present case is a milestone in pollution control and all parties involved are to be commended. It represents what is capable of achievement by cooperation between industry and the State and furnishes a solution which is both technically feasible and economically reasonable, to the benefit of the immediate community, the Company itself and the people of the State of Illinois.

I, Christan Moffett, Clerk of the Illinois Pollution Control Board, certify that the above Opinion was adopted on this 3rd day of May, 1972, by a vote of 5-0.

Christan D. Moffett

