

Effluents from the Mathura Refinery

*M. Kurien**

The possibility of effluents from the Mathura Refinery adversely affecting the environment at Agra and Mathura has been under very close examination in the Ministry of Petroleum and in the Indian Oil Corporation, the Project authorities. The IOC has been in touch with a number of organisations both within the country and abroad in its efforts to seek adequate guidance to ensure that the effect of emission of pollutants is controlled to such an extent that there would be no adverse effect. The steps that are being taken and proposed to be taken by the IOC are briefly mentioned below :

The types of effluents from the refinery can be divided into two categories ; those to be discharged to the surface and those to be discharged to the atmosphere. Effluents to be discharged to the surface will be treated waste water which may contain as pollutants oil, phenol and sulphides. The treatment facilities proposed to be installed in the refinery will ensure that all these contaminants are reduced to below the limits specified by the current Indian Standard Specifications for industrial effluents to be discharged into inland river waters. Adequate technology and know-how and manufacturing capacities exist within the country for providing the necessary treatment facilities. The treated waste water is proposed to be discharged into the Jamuna river down stream of Mathura and facilities for the proper dilution of the treated effluents with the river water will be provided at the point of discharge. The use of treated water for irrigation purposes is also under consideration.

Among the effluents to be discharged to the atmosphere are petroleum vapours, catalyst particles and flue gases. The discharge of petroleum vapours will be minimal because of the use of floating roof storage tanks. Petroleum vapours in low concentration are not a health or environmental hazard. The catalyst particles discharged in the form of fine powder are an inert synthetic material, chemically very similar to clay and will not cause any adverse effect.

The major pollutant in the flue gases discharged to the atmosphere

* Managing Director, Bharat Refineries, Bombay.

is sulphur dioxide from the furnaces in the refinery. The sulphur dioxide gas combines with moisture to form acid which would corrode marble. The sulphur dioxide in the flue gases arises from the sulphur present in the crude oil and consequently also in the fuel burned in the refinery furnaces. The IOC plans to reduce the emission of sulphur dioxide as follows :

- (i) The refinery will process 50% very low sulphur Bombay High crude and only low sulphur fuel oil from this crude will be used in the refinery furnaces.
- (ii) The flue gases will be scrubbed to remove sulphur dioxide.
- (iii) The height of the stack would be increased to 80 metres to facilitate better dispersion of sulphur dioxide in the atmosphere.

To calculate the resultant ground level concentration of sulphur dioxide in the Agra region due to its emission from the Mathura Refinery, which is situated 40 KM by air from Agra, the India Meteorological Department is carrying out extensive investigations. These include collection of meteorological data and the use of computer programmes to work out the dispersion of sulphur dioxide in the atmosphere. The studies so far carried out have been based on the use of mathematical models and constants developed in other countries. Further investigations are under way to confirm the correctness of these constants under the local meteorological conditions.

Since much work has been carried out in Italy on the effect of sulphur dioxide on marble monuments etc., IOC has entered into an agreement with M/s Tecneco—an Italian firm which is a subsidiary of Government owned ENI group, which is dealing with pollution and its control. Tecneco's scope of services comprises two main parts :

- (i) Determination of the typical meteorological conditions from the point of view of atmospheric pollution and calculation of the ground level concentration of the effluents, particularly at Agra.
- (ii) Determination of the existing level of pollution in the Agra zone and the present status of preservation of the monuments. Experts from Tecneco are already working in the Agra-Mathura area.

Apart from obtaining expert advice from Tecneco, IOC has constituted a Project Group with Dr B. B. Lal, retired Chief-Chemist of the Archeological Survey of India as Group Leader. This Group will cover all

aspects related to the preservation of monuments and coordinate with other Departments such as the India Meteorological Department (IMD), Archeological Survey of India, Department of Science & Technology, CSIR, etc.

To advise the IOC, who are the project authorities, on a continuing basis on the measures to be taken for keeping the pollution effect of the Mathura Refinery on the Taj Mahal and other historical monuments to the absolute minimum, an expert committee has been constituted. This Committee, under the Chairmanship of Dr. S. Varadarajan, Chairman, IPCL, includes representatives from the Ministry of Petroleum, IMD, National Committee on Environmental Planning and Coordination, National Environmental Engineering Research Institute, Indian Institute of Petroleum and the Government of Uttar Pradesh. Representatives from other organisations such as the Archeological Survey of India and the Indian Standards Institution are being invited to the Committee's meetings as necessary. This Expert Committee is coordinating all actions leading to studies on the existing levels of pollution, collection of meteorological data etc., collating and analysing information available world-wide with special reference to monuments of stone and marble, and recommending measures to be adopted by the IOC.

It will thus be seen that Government are seized of the problem and are taking suitable action not only to reduce the emission of pollutants from the refinery, but also to treat the effluents in such a way that the pollutants do not adversely affect the historical monuments at Agra in particular, and the environment in general. The several investigations and studies now underway will enable the IOC to take all necessary steps to achieve this aim.