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**M E M O R A N D U M**

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**DATE:** 9th February 1998  
**TO:** Members of Agency Board  
**FROM:** Jim Moriarty  
**RE:** Application for IPC licence from Ship Company Ltd

Application Details	
Name of applicant;	Ship Company Ltd.
Location of activity:	Killarney Road, Macroom, Co. Cork
Class and Nature of activity:	13.2 - The manufacture of integrated circuits and printed circuit boards.
Reg. No.:	255
Licence application received:	04/03/97
Notice under article 11(2)(b)(ii) issued:	07/04/97
Information under article 11(2)(b)(ii) received:	19/06/97, 07/7/97, 05/12/97, 23/12/97
In compliance:	23/12/97
Site Visits:	14/04/97, 14/1/98

**Introduction**

Ship Company Ltd have applied to the Agency for an IPC licence under the following heading:

*13.2 The manufacture of integrated circuits and printed circuit boards.*

The process involves putting a copper coated board through a number of cleaning, plating and etching stages. Ship are involved in the manufacture of two main product lines - single sided PCBs and double sided PCBs. Approximately 70% of production is double sided boards. The major difference in processing between the two types of board is in the first stage. Double sided PCBs undergo a Direct Metallisation process whereas the single sided boards are electroplated.

The main unit operations involved in the process may be described as follows;

- Board Preparation (drilling, routing etc)
- Board cleaning
- Plating line (electroplating or direct metallisation or both)
- Curtain coating for Soldermask
- Etching line
- Screen printing
- Inspection (electrical testinig)

35 people are employed in the activity and the normal operating hours are 6am to 1am Monday to Saturday.

## **Emissions**

### **Air:**

The applicant has noted some 22 emission points from the plant. Monitoring undertaken as part of the application process, allied to some monitoring results done to comply with Air Pollution licence, has shown all emissions are within licensed and BATNEEC levels. Inorganic emissions from the treatment baths are minor.

Only the exhausts from the Dust Extractors (S-27 and S-28) have abatement associated with them. This is in the form of a cyclone to remove dust generated from the board drilling operation. BATNEEC levels of 5mg/m<sup>3</sup> (TA Luft Inorganic Dust Class III) are imposed on these emissions along with a requirement for bi-annual monitoring.

Organic emissions from the curtain coating process were shown to be minor. The Batch Oven monitoring has indicated concentrations of organics (including Trichloroethylene - a TA Luft Class I Organic). These were within BATNEEC guidelines and so annual monitoring of this emission point (S-29) is proposed in the PD in order to ensure emissions from this source remain low.

Marked gas oil (Sulphur Content 0.5% maximum) is used in the boiler. Emissions from the boiler are not significant. There is no history of odour problems associated with atmospheric emissions from this activity.

### **Process Effluent :**

Effluent generated on site is treated in a waste water treatment plant (WWTP). This consists of pH adjustment, settlement, and filtration. A recent addition to the WWTP is an electrowinning cell. This involves the redissolution of sludge in acid and the recovery of copper in a plating cell. The copper is extracted out of the solution and deposited as copper metal on a stainless steel plate. Once the copper has been removed from the solution, it is returned to the front end of the plant for neutralisation. This innovation has resulted in a major reduction in copper concentration in the effluent (levels now typically < 0.5 mg/l) but an increase in Sulphates because of the acid used in the process. Section 97 consent has been received for the discharge and conditions included in the PD reflect this.

A second trade effluent stream consisting of waste from the dry film resist development process is treated separately for pH adjustment before discharge to sewer. The company are to install dedicated flow measurement on this discharge within three months of date of grant of licence. Condition 6.5 requires a proposal for flow measurement to be submitted to the Agency for agreement within two months of date of grant of licence. The applicant is currently examining the different options in providing this measurement and so the two month timeframe is not considered restrictive.

### **Non-Process Water:**

Uncontaminated roof and site run-off water drains to two soakways. No surface water monitoring requirement is being imposed on the company as there is no direct discharge to surface waters.

There is a 600 litre capacity sump in the yard adjacent to the waste storage area. A submersible pump within the sump is float activated and pumps contents to the front end of the effluent treatment plant.

Bunding requirements on-site for drummed waste materials, are less than satisfactory. Condition 9.3.1 of the PD relates to bunding and a timeframe of nine months to meet Agency requirements is conditioned

### **Waste:**

Quantities of process and effluent treatment plant wastes estimated at 20 tonnes are stored on-site. These wastes are comprised of metal bearing sludges, spent etchant

solutions and process rinses. Condition 7.3 requires a study to be carried out on the waste stored on site. This study, to be completed in three months, requires a complete classification and quantification of the waste to be carried out as well as seeking proposals from the company on possible disposal options for the material. Following agreement with the Agency, the recommendations of the report are to be implemented in a timeframe to be agreed with the Agency.

Some waste recovery in the form of electrowinning is carried out on-site. This is to be welcomed but further work is necessary to ensure that the amount of waste stored on site can be minimised.

Analysis and Disposal of Wastes (both hazardous and general) as specified in Schedule 3 are incomplete at the moment, with provisions made for additional requirements following the submission of the Waste Study referred to above. In any event, Condition 7.6 requires that a Waste Record be kept.

#### **Noise:**

Noise monitoring undertaken as part of the application indicated two operations (compressors and dust extractor) carried on external to the building which are sources of noise. The PD, while requiring day-time and night-time levels of 55 and 45 dB(A) respectively at noise sensitive locations, also requires a programme to reduce noise emissions from the above two sources to be established. A noise survey every three years is also proposed. There have been no complaints in relation to noise from the activity

#### **Groundwater**

Very little useful information was provided by the applicant in relation to groundwater quality under the site. More detailed information is required to be provided by this company in the form of a hydrogeological investigation of the site, with the provision of monitoring wells as required. Any issues related to groundwater quality will be addressed once the hydrogeological study has been carried out. The one well that has been sunk on site is to be monitored bi-annually as per Schedule 4(i) of the PD. There is provision in the PD for including any additional boreholes in the monitoring requirements for the site.

#### **Residuals Management & Environmental Liability Insurance**

Conditions relating to Residuals Management & Environmental Liability were included in the PD primarily because of the waste storage practices in use on-site. A large amount of spent plating solutions, etchants etc. are stored in barrels and drums in an out-of-doors, unbunded, uncovered area. A stream flows adjacent to this area and is considered highly vulnerable in the event of spillage. The independent Environmental Liabilities Risk Assessment required in Condition 14.3.1 should act as a powerful motivator in acting towards minimising the quantities of waste stored on site as well as ensuring that any waste stored is in a banded area with minimal risk of environmental pollution.

Given the historical practices of the company, it is also deemed necessary to condition a Residuals Management plan. In the event of closure, this will cater for the removal of any contaminated land or groundwater as well as ensuring that any wastes not removed off-site under other conditions of the licence are suitably dealt with.

Condition 9.2.2 requires a comprehensive hydrogeological investigation of the site (including the waste storage area) to be undertaken within a year of the licence being granted. Condition 9.3.1 of the PD relates to bunding and a timeframe of nine months to meet Agency requirements is conditioned

#### **Carcinogens, Class I organics and Heavy metals:**

Copper and copper sulphate, nickel chloride, nickel sulphate, tin, lead, palladium, molybdenum and gold potassium cyanide are used in the process. Trichloroethene, a

TA Luft Class I organic is used also. The application also lists Formaldehyde as being in use but the electroless Copper process in which it was used has been discontinued.

### **Submissions**

There were two submissions in relation to the application

*1. South Western Regional Fisheries Board, Macroom, Co. Cork*

Two broad points are made in this submission. The first relates to the possibility, in the event of high flow/malfunction in the system, that some of the sewer contents can by-pass the treatment works and discharge directly to the Sullane River. The SWRFB submit that the discharge should only be allowed if the Council can demonstrate that it is, on all occasions, capable of providing adequate treatment. The second point in the submission relates to the assessment of the impact of the discharge on the receiving waters and ask that a toxicity assessment be carried out.

It is considered that the Sanitary Authority, in their Section 97 consent, have agreed to receive the discharge from the company and that this is sufficient to address the concerns about possible bypasses leading direct to the Sullane River. Condition 9.3.6 imposes a requirement on the company to test and inspect underground sewer pipes. In relation to toxicity, Condition 6 of the PD requires a toxicity assessment to be carried out on the effluent from the plant.

*2. Department of the Marine, Dublin 2.*

Comment that BOD/Suspended Solids levels of 20/30 should apply for discharges to surface waters. Also concerned about the rising phosphorous levels in watercourses.

Ship Company Ltd. do not discharge trade effluent directly to surface water. All trade effluent is discharged to the UDC sewer and consent has been received from the Sanitary Authority for the discharge.

### **General Comment**

Environmental management procedures at Ship Company Ltd. are not well developed and historical operational practices have resulted in some issues that need further attention. It is considered that this is best dealt with under the Conditions of an IPC Licence rather than seeking further information on proposals at this stage. Greater control and guidance can be exercised through the enforcement of licence conditions.

### **Recommendation**

The issue of the proposed IPC licence as submitted to the Board.

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Jim Moriarty  
Licensing and Control