I N T E R O F F I C E M E M O R A N D U M

Date: 25-Aug-1988 11:16pm EDT
From: FOSTER KNIGHT
KNIGHT.FOSTER AT A1 AT WITNES A1
Dept:
Tel No:

TO: See Below

Subject: Sludge Exports Review

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D I G I T A L C O N F I D E N T I A L

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I've received many thoughtful and insightful comments from you on the sludge export issue. I would like to express my appreciation for your high level of interest and participation, and give you some initial feedback.

With respect to a broader policy framework for managing Digital's hazardous wastes in Europe, GIA and the U.S., I will shortly be circulating to you a draft policy or guideline. In the meantime, I would like to share with you the substance of the comments I've received and some of my thoughts.

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Virtually everyone agrees that Digital should be following the principle that hazardous wastes generated by Digital in a particular country should be disposed of in that country in the most environmentally acceptable manner (or, as one commenter put it, following the best practical environmental option).

Unfortunately there are and probably will continue to be situations in

country for disposal of hazardous wastes. Such may well be the case in Ireland today--forcing Digital to export its Clonmel and Galway generated wastes to the U.K. for disposal. There are other examples. Thus we need to fashion a hazardous waste policy which--in narrowly defined, critical cases--still allows Digital to export hazardous wastes.

At the same time, we will need to focus greater efforts working with governments toward ensuring the creation and availability of environmentally acceptable waste disposal sites and reclamation/recycling options so that exports are not required. Thus, several significant comments emphasized the need for Digital's business plans at the country level to incorporate strategies and actions for ensuring proper disposal of hazardous wastes generated by Digital in that country (for example, country and manufacturing/engineering site managers--in concert with Area management--working directly with the government agencies to discuss hazardous waste management needs like disposal sites, in the context of Digital's overall business, technology transfer, and economic benefits to that country).

We must also remember that waste considered non-hazardous today may be considered hazardous in the future. Digital, and the computer industry as a whole, face a major challenge in managing huge volumes of scrap computer products (including parts and components) in an environmentally sound manner. Our waste management policy or guideline will need to address this issue as well.

Finally, the past 6 months has seen considerable worldwide publicity about exports of hazardous waste, including some "horror stories" about exports to third world countries. This will undoubtedly lead to new legislation in the U.S. and, perhaps other countries as well. Our

likelihood of tighter restrictions.

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TO: TERESA BUCKLEY @MLO

CC: DAVID BARRETT @MLO
CC: LUIS URETA @SGO

digital

INTEROFFICE MEMO

TO: Foster Knight

DATE: 5 August 1988
FROM: ALBERT E. MULLIN, JR.
DEPT: CORPORATE RELATIONS
MS: MSO/N9 EXT: 223-5350

SUBJECT: Hazardous Waste Export Review

DIGITAL CONFIDENTIAL

Foster, it is my opinion that to export sludge wastes from San German, P.R., Greenville, or anywhere else, to sites outside of P.R. or the continental U.S. is socially and perhaps morally wrong. Further, from an environmental perspective, I believe it is inconsistent practice relative to Corporate Policy Memorandum 74-3, dated 6/84: Digital Philosophy, which is still operative.

"Environment - As good citizens [I presume worldwide], we believe we have the responsibility to keep our environment [presumably worldwide] free of pollution and to set an example."

"First Rule - When dealing with a customer, a supplier, or an employee [I'll add Society], do what is 'right' to do in each situation."

Recognizing fully the operational, economic and regulatory aspects of the issue, export of our industrial waste neither sets a proper example nor is it necessarily the right thing to do. I personally would be hard pressed to defend or explain our behavior to host governments, non-U.S. employees and, probably, U.S. employees as well, or to the communities in which they and our customers reside. Is the issue of disposal reclamation or cost? Disposal is our problem! We may not like it, but reclamation (Option 1) and accelerated efforts at sludge minimization with attendant high costs in the interim is a preferred option.

Sending sludge offshore is only a short-term fix - ultimately no one anywhere will accept it, or if they do, the economic impact will be prohibitive.

I'd counsel not sending sludge to the U.K. or elsewhere. We are setting the Company up for a potential adverse reaction and embarrassment!

We should be developing now a plan to reshape and create public policy which recognizes the need for economically viable industrial waste siting in the United States and the implications of further delay in siting. This issue can be worked through our electronics trade associations and in coalition with many of our "friends" in industry who must be facing a similar dilemma. This is an industry problem - basic industry as well as electronics - here in the Commonwealth and elsewhere. Public officials are just avoiding it.

Grace Hinchman and I may be helpful in this dimension of the solution.

esm

CC: David Barrett
Bruce Holbein
Tom Siekman
Marietta Ethier
Geoff Shingles
✓ Jef Gibson
Laura Goldin
Jim Rogers
Steve Greene
Grace Hinchman

I N T E R O F F I C E M E M O R A N D U M

Date: 6-Dec-1988 01:15pm EST
From: GEOFF SHINGLES
SHINGLES AT A1_CHEFS at CALC
Dept: BOARD OF MANAGEMENT
Tel No: (7)830-3238

TO: See Below

Subject: EXPORTING HAZARDOUS WASTE

This problem is still rattling around as follows:-

Mr David Bensusan of Euronet is bending my ear quite strongly (but politely) about his company's work with us. He deals, I believe, with hydroxide residue for the recovery of non-ferrous metals. I am not a chemist and I am poorly qualified to deal with his arguments which say that it is all safe and that he will write me letters of reassurance etc.

Press RETURN to continue or EXIT SCREEN to exit

From a UK standpoint and from a personal standpoint, I feel, as I have said before, that sludge and waste products should be dealt with within the country which generated them. Mr Bensusan has obviously been informed of my point of view on this. What I need to know is what is the Corporate decision on this topic. Does it coincide with mine or is it different? If it coincides with mine, I will inform Mr Bensusan that this is a Corporate decision and if he does not agree with it he should deal with our Corporate experts (who are they?). If the corporate decision does not coincide with my personal viewpoint, I would make the Corporation aware of the potential problems if we receive unwanted publicity in the press as a result of the considerable concern that people have with the environment and the rising "green" movement. The Corporation could then decide whether to change its decision and agree with my point of view or stick with its own point of view.

Please advise me of the Corporate decision so that we can tell Mr Bensusan. I do think that this issue needs to be cleared up fast.

Thanks in advance.

Regards,

Press RETURN to continue or EXIT SCREEN to exit

Please advise me of the Corporate decision so that we can tell Mr Bensusan. I do think that this issue needs to be cleared up fast.

Thanks in advance.

Regards,

Distribution:

TO: STEPHEN GREEN @MLO

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CC: NIGEL BAINS @KRR
CC: CLIFF CLARKE @OGO
CC: BEAT STIEFEL @GEO

58 lines printed - Press RETURN

Dept:
Tel No:

TO: See Below

Subject: HAZARDOUS WASTE EXPORT REVIEW

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D I G I T A L C O N F I D E N T I A L

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This memo involves an important environmental policy issue requiring your response.

Digital is currently exporting sludge wastes from its San German, P.R. plant to a metals reclamation facility in the U.K. Our Greenville plant may also export its sludges to the U.K. These sludge exports are only for metals reclamation; no sludges would be placed in land disposal sites.

Exporting hazardous wastes (even if only for beneficial metals reclamation) raises fundamental policy questions for Digital -- which has manufacturing (hazardous waste-generating) and sales activities in major industrialized nations. A key concern is possible damage to Digital's corporate image from publicity about a U.S. company exporting its hazardous waste.

First, what are the hazardous wastes in question? They are sludges produced--after wastewater treatment--from printed wire board manufacturing. They are regulated strictly as "hazardous wastes" in the U.S., primarily to minimize potential groundwater contamination from metals such as copper, chromium, and nickel.

David Barrett (Corporate Manager for Environmental, Health & Safety) asked the Law Department to review the sludge export issue from a legal and policy perspective, in close consultation with the responsible corporate, area, country and plant managers. Essentially, there are only three options, the pros and cons of which are summarized in Attachment A. Attachment B describes the sludge management problem in more detail. Questions for Digital managment are listed in Attachments C and D.

I would like your response to the sludge export issue in terms of both 1) specific sludge exports to the U.K. and 2) the direction you think Digital should move towards in its waste sludge management. From your

management recommendation.

I would appreciate your responses by August 15, 1988.

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D I G I T A L C O N F I D E N T I A L

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ATTACHMENT A

OPTIONS FOR SLUDGE WASTE MANAGEMENT -- PROS AND CONS

1. SEND SLUDGES TO U.S.-BASED METALS RECLAMATION FACILITIES

PROS:

- metals reclamation is the environmentally-preferred alternative method of disposition
- avoids export issue (a Digital facility that generates hazardous waste should find a disposition solution in that Digital facility's own country)

CONS:

- may not be a viable alternative starting in 1989 (it is quite possible U.S. smelters will refuse to accept sludge wastes for metals reclamation because higher regulatory processing costs

- U.S.-based metals reclamation facilities for sludge wastes are fewer in number and economically less efficient that comparable facilities in Europe (higher transaction costs)

2. EXPORT WASTE SLUDGES TO EUROPEAN METALS RECLAMATION FACILITIES

PROS:

- metals reclamation is the environmentally-preferred alternative method of disposition

- exporting sludge wastes to Europe is also the least costly alternative (savings are estimated at $200 - 250K/year)

CONS:

- potential for adverse publicity and consequential damage to Digital's good will

3. BURY WASTE SLUDGES IN U.S.-BASED LICENSED HAZARDOUS WASTE LAND DISPOSAL SITES

PROS:

- In the short term, this is the easiest (albeit

most expensive) legal option

CONS:

- environmentally worst alternative (because hazardous metals are still in the ground)
- will be the most expensive option after new EPA "land ban" regulations go into effect in August 1988
- poses long-term cleanup liability if the rules change
- increasing risk that community and national political pressures will result in closure of land disposal facilities

ATTACHMENT B

SUMMARY OF SLUDGE EXPORT STRATEGY

This memo summarizes Digital's current and planned strategy for managing hazardous waste metal hydroxide sludges generated by its printed circuit wireboard manufacturing plants in Greenville, South Carolina and San German, Puerto Rico.

The management strategy involves exporting San German and Greenville sludges to a reclamation/recyling facility in the U.K. The sludges would be dried and blended at the U.K. reclamation facility and then shipped to independent smelters in Sweden, W. Germany, the Netherlands and other locations.

The key concerns are:

- o as a matter of policy, should Digital allow any exports of hazardous wastes (even for beneficial reclaim purposes)?
- o potential damage to Digital's corporate image from publicity about a U.S. company exporting its hazardous waste, and related impacts on Digital employee relations

Fundamental premises underlying the

- exports would only be made to a European (U.K.) metals reclamation facility (no land disposal in Europe);

- reclamation of valuable metals from metal hydroxide sludges

is the preferred disposition alternative--at least for the next two years (longer-term, the preferred method will probably be a combination of on-site metals reclamation and dramatic reduction in sludge generation through technological innovation);

- currently, the most efficient facilities for reclaiming metals from sludges are in Europe;

- non-export alternatives (land disposal and reclamation in the U.S.) are subject to tighter U.S. environmental protection regulations and, hence, significantly higher costs (current cost differential is estimated at $200 - 250K/year; this could escalate significantly).

The sludge management plan and actions taken are discussed in more detail below.

Sludges

What are sludges? Sludges are wastes--after wastewater treatment--from printed wireboard manufacturing operations. Sodium hydroxide and several other agents are used in wastewater treatment to precipate out metals in wastewater, so that these metals cannot enter into public

sewer systems. The resulting sludges (after drying) are bluish-green, have a chunky, powdery consistency, and contain various metals including copper (as much as 5 - 6%), chromium, lead, nickel, and very small amounts of arsenic, mercury, silver and barium. Sludges are considered hazardous under U.S. regulations, primarily because of the potential for these metals to contaminate groundwater.

U.S. Hazardous Waste Regulations

Since 1980, metal hydroxide sludges generated by Digital's U.S. operations have been regulated strictly under the U.S. federal Resources Conservation and Recovery Act (RCRA) and EPA implementing regulations. Metal hydroxide sludges are classified as hazardous wastes under the RCRA regulations. These regulations require "cradle to grave" handling of wastes and impose strict requirements on transportation, processing, and disposition methods. Land disposition of wastes has come under increasingly tighter regulation, particularly since 1984. In August 1988, a "land ban" goes into effect in the U.S. under new EPA regulations governing sludge wastes. The "land ban" prohibits land disposal of sludges unless they are first treated to minimize future leaching of metals and potential metals contamination of groundwater.

Reclamation and recycling of sludge wastes are also subject to RCRA regulations. Currently, smelting dried wastes for metals reclamation is exempt from the most rigourous regulatory requirements for "treatment, storage, and disposal" of hazardous wastes. A pending EPA regulation, however, will likely remove that exemption. It is quite possible, therefore, that U.S. smelters will refuse to accept sludge waste for reclamation after January 1, 1989, in order to avoid the newer, more

RCRA and other U.S. federal environmental laws have introduced new requirements for waste minimization as a preferred solution to the general problem of hazardous waste management (each plant must reduce amounts of hazardous wastes generated by its operations).

A related federal law, SARA Title III, requires public reporting of certain hazardous substances use and disposition data. SARA Title III will cause greater public exposure of Digital's hazardous waste management strategies (including the fact that sludge wastes are exported).

1983-1984 Exports

Starting in 1983, Corporate Energy and Environmental Affairs began investigating the feasibility of reclamation as an alternative to land disposal. In 1984, Digital's San German plant entered into a contract with Amlon U.S. to export about 1,100 tons of metal hydroxide sludges to Amlon-Euromet's reclamation facilities in the U.K. and Holland. The exports were made in late 1984 after filing the necessary notices with the U.S. EPA's Office of International Affairs.

No further Digital exports of metal hydroxide sludges occurred in 1985 - 87 because alternative U.S.-based reclamation facilities in Arizona and Pennsylvania proved to be more a convenient and competitive alternative for disposition of San German's sludges.

The Greenville plant, by comparison, has not exported any of its metal hydroxide sludges. Greenville's sludges have been disposed of at a licensed hazardous waste land disposal site in South Carolina. Increasingly tighter land disposal requirements and much higher future disposition costs, however, are causing Greenville to examine other alternatives, including exports, reclamation by third parties in the U.S., and higher level waste minimization/reclamation on site.

New Exports

In late 1987, primarily for cost/competitive reasons, the San German plant asked Corporate Energy and Environmental Affairs to assist them in re-establishing the export contract with Amlon-Euromet. Corporate Energy and Environmental Affairs visited Euromet's Wath Reclycing Facility in the U.K. in November 1987 and found it to be a sound

operation, adequately financed and operating in accordance with U.K. legal and licensing requirements. In February 1988, Corporate Energy and Environmental Affairs filed the required notices with the U.S. EPA and the U.S. State Department of its intention to export hazardous waste to the U.K. [The U.S. State Department formally transmits these export notices to the receiving government's Environmental Ministry, giving the receiving government an opportunity to veto the export]. In April 1988, Digital received clearance from the U.S. EPA to proceed with the exports. In early June, two containers of sludges (about 45 tons) were loaded on board a ship in San Juan, Puerto Rico. The sludges are expected to arrive in the U.K. in early July 1988.

The sludge management strategy would involve similar shipments every few months, at the rate of about 1,300 tons/year (includes total sludge output from San German and Greenville). These volumes will drop as Digital's waste minimization program increasingly takes effect.

Transportation and Safety

Sludges shipped for export to the U.K. are bagged, labeled as hazardous wastes, and placed in special containers before loading on a ship. On arrival in the U.K., the bagged sludges will need to be unloaded and transported in accordance with U.K. regulations governing hazardous wastes.

U.K. Metals Reclamation Facility

Euromet's Wath Recycling Facility in South Yorkshire is one of the

sludges are first dried to reduce water content to about 15%. The dried sludges are then assayed and sometimes blended with other dried sludges to achieve the desired metals content specifications of a particular smelter. Sludge treatment and processing apparently does not result in hazardous residues (this is subject to confirmation). The sludges are then shipped to a smelter, for example, the Boliden smelter in Sweden. The smelting operation extracts valuable metals and leaves a glassy slag residue which is considered to be non-hazardous.

Euromet's Wath Recycling Facility has two permits from the local control authority. One is a long-term permit for the operation of the facility for metals reclamation. The second is an annually-renewable license for air discharges in connection with drying and heating operations.

Euromet is planning to expand their Wath Recycling Facility by leasing adjacent land for building a laboratory (sampling materials and assaying) and for temporary sludge storage.

Euromet is apparently a sophisticated company, with large and small customers in many countries, and good working relationships with the U.K. Ministry of Environment, the local South Yorkshire control authority in Rotheram, and with environmental agencies other countries.

Exports By Other Computer Companies

Currently, 12 or 13 U.S. companies are exporting their hazardous waste to the U.K. -- all for reclamation/recycling (primarily metals). We are attempting to determine the identities of these companies and related details. We do know that these U.S. waste exporters include several electroplaters that generate sludges. As far as we

can determine, no U.S. computer companies are exporting their sludge wastes to Euromet's Wath Recycling Facility.

Metals Reclamation In the U.S.

There are several metals reclamation facilities in the U.S., including World Resources Corporation (WRC) and Boliden.

Of these, apparently only WRC is a viable metals reclaimer for Digital (the Boliden facility, located in Rhode Island, is currently engaged in litigation with the U.S. EPA).

During 1985 - 1987, San German shipped its sludges to WRC's facilities in Arizona and Pennsylvania. As with the Euromet facility in the U.K., WRC dries the sludges, sometimes blends them, and then ships them to a smelter such as Phelps Dodge. WRC also exports processed sludges to smelters in Canada and other locations.

There is increasing regulatory uncertainty over whether metals reclamation facilites such as WRC will continue to enjoy a legal exemption from the stringent regulatory requirements for facilities that "treat" hazardous wastes. If WRC and other metals reclamation facilities become subject to more stringent permitting and other regulatory requirements affecting treatment facilities, we can anticipate higher costs should we decide to use them.

Proposed EPA regulations imposing new requirements on treatment, storage and processing of sludge wastes will likely impose new regulatory requirements on smelters that process sludges for metals reclamation. As a result of these new requirements, it is quite possible that by 1989, smelters in the U.S. will refuse to accept sludge wastes for metals reclamation.

ATTACHMENT C

Questions For U.K. and European Management

1. From Digital U.K.'s perspective, what is the risk that

single out and publicize the generic issue of a major U.S. multinational company exporting its hazardous wastes to Great Britain? What is the risk that the generic issue would specifically focus on Digital's sludge exports to the Wath Recycling Facility?

2. How would Digital U.K. evaluate the impact on Digital U.K.'s corporate and public image and on employee relations of any publicity about Digital hazardous wastes being shipped from the U.S. to the U.K.? Does it make any difference that the hazardous wastes are metal hydroxide sludges destined for beneficial metals reclamation (i.e. as opposed to landfilling or incineration of notoriously toxic wastes)? Does it make any difference that the sludge shipments were first reviewed and not vetoed by the U.K. Ministry of Environment?

3. What is Digital U.K.'s position on this sludge management strategy? What additional facts does Digital U.K. need in order to reach a position?

4. From Digital European management's perspective, what impact on Digital Europe's corporate and public image and on employee relations would result in the event of publicity focusing on Digital shipments of sludges to the U.K.?

5. What is Digital Europe's position on this sludge management strategy? What additional facts does Digital Europe need to reach a position?

ATTACHMENT D

Questions For U.S. and GIA Manufacturing and Corporate Management

1. From GIA Manufacturing and San German plant management's perspective, have the non-export alternatives been adequately explored? Do GIA Manufacturing and San German plant management fully support the proposed export strategy?

2. From U.S. Manufacturing and Greenville plant management's perspective, have the non-export alternatives been adequately explored? Does U.S. Manufacturing and Greenville plant management fully support the proposed export strategy?

3. How would Corporate Relations, Corporate Public Relations, and Corporate Employee Relations evaluate the impact on Digital's corporate and public image and on employee relations of any publicity about Digital hazardous wastes being exported to the U.K. (albeit for metals reclamation)? How should we evaluate Digital's possible vulnerability to criticism that its sludge exports are the "wrong" response to the new EPA-mandated "land ban" on disposal of sludges which goes into effect in August 1988?

4. What is Corporate Management's position on the proposed sludge export strategy? What additional facts are needed in order to reach a position?