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Our Ref: CMW/MQ
24 December 1984

Received 2/1/85
3 copies to SM

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2/1

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Dear

I enclose a section on offsets for inclusion as Appendix 2 of the response. There are one or two places where we have amended the calculations in the software area, to reflect the revenue foregone by the company, rather than the cost of the software. In other respects there are few changes compared with the presentation at our visit, although we have looked at all the avenues we can again.

There is a paragraph or two on the ideas of keeping exploration data on-shore, rather than let it and the accompanying expertise all be off-shore and the idea of a shared system. These both appear to be relevant to the offsets question.

We are working on the remainder of the document and hope to have it with you early in the New Year.

May I wish you all the Season's Greetings and look forward to hearing of how the offsets issue proceeds.

Yours sincerely

ACCOUNT MANAGER

APPENDIX 2 - OFFSETS

A.2.1

Offsets Proposals

We have studied the offsets programme with a view to being as compliant as possible. However, in a field as specialised as the construction and support of Supercomputers, it is difficult to find obvious opportunities for direct offsetting participation by Australian industry.

Our policy in bringing our products to a new country, is however, wherever possible, to make the maximum contribution to the local economy we can. We establish a subsidiary with responsibility for the support and maintenance and marketing of our products in that country, and recruit and train nationals with the objective of the subsidiary becoming self sufficient as rapidly as possible. This does appear to meet some of the stated objectives of the programme, for Australian nationals will become the nucleus of a group with "Supercomputer" expertise in Australia.

There are significant technology transfer benefits accruing to the new subsidiary and its customers by this policy. It is worth stating that the Cray Super-Computer, its construction details, documentation, software and the techniques used to make effective use of the system are all items for which an export licence is required from the USA. All these areas are classified as of strategic importance and of key technology value, not only for the details of the system's construction but equally for the capability represented by the computing power of the system and the know how, of how to apply it. Export licences, are, as you will know very restricted for those items judged of key strategic importance.

The value of the technology transferred to an Australian subsidiary, is in essence the accumulated value of the company's world wide experience to date. It is difficult to put an accurate number on this - nor can we comment on the value of the capabilities of the equipment to the user.

However such technology transfer to our subsidiary and Australian customers is in addition to the value of the hardware offered and of any software provided at no charge.

A.2.2

Hardware

We have looked at the major technological components going to make up the system and are not aware of any capability in Australia to source any of these locally. Typical of the types of components we are seeking quantity supplies of are:

- i) 16 gate. Flat pack, gate arrays in ECL Bipolar. Switching times of less than 500 pico seconds 1984/5
- ii) 64 or 256 K bit static or dynamic MOS, flat pack, memory components.
Access times:
less than 50 nano seconds 64 K 1984/5
100 nano seconds 256 K 1985/6
- iii) 16 K or 64 K bit Bipolar ECL, flat pack, memory components.
Access times:
less than 25 nano seconds 16 K 1984/5
less than 20 nano seconds 64 K 1985/6
- iv) Gallium arsenide 3½" wafers 1984/5

You will appreciate that for systems with a lead time of 12 months, our component supply plans for 1985 are already made. However the above may give some indication of the areas of interest. Simply put, it is for products at the leading edge of speed, followed second by packing density, in reliable technologies. Unfortunately this is at the specialist end of the spectrum and volumes are not very high.

A.2.3

Software

In the software area the company develops software both centrally, for operating systems and compilers, and in the subsidiary locations for products to link Cray computers with other systems. It is our intention to encourage the Australian subsidiary to develop in this field, but our experience has been that there is a critical size before this system software activity becomes economically or practically viable, of about 3-4 Cray installations.

Many external organisations develop application software for running on Cray systems, which are then offered by those vendors for a charge. The Cray company helps and encourages specialist vendors to make their software available. There are now over 200 major application programmes available as a result of this policy ranging from mathematical function libraries, through large structural analysis codes to sophisticated movie generating graphics.

We would extend this offer of help and assistance to any Australian software group wishing to make its software available to the worldwide Cray community. This would transfer expertise directly to Australian based companies, resulting in technology transfer, together with the revenues earned by the software vendors. Part of the role foreseen for the Australian employees of Cray is to help and assist in such conversions, both for the Department of Defence and for other organisations.

A.2.4

Services

Cray currently offers via its UK subsidiary a remote Cray bureau service to Australia. The Department of Defence has been making use of the facility. This facility is also available to other Commonwealth departments and to Australian industry generally.

We are however looking for an opportunity to locate a second Cray system in Australia, which would be able to provide a more local facility and enable the Australian subsidiary to have a more public role.

In situations where a number of organisations would benefit from access to a system, but where none can yet justify a system of their own, we have in some cases assisted in the provision of a shared system. The scheme is simply that the machine is located on the majority user's premises, and access provided to the other parties. In these circumstances we have been willing to provide some funding ourselves and would be pleased to discuss this idea further if it is regarded as of interest. We know of at least one Commonwealth department which could be interested in such a scheme, together with some organisations in industry.

Turning to Australian industry, it would seem that a major opportunity exists to develop skills and expertise locally in the fields of oil, gas and mineral exploration and production. These are areas where the capability of Cray systems is being recognised around the world, as of great benefit in the production and exploitation of natural reserves.

From a policy and strategic point of view there would seem to be great advantages in encouraging this work to be performed in Australia. We have already suggested that perhaps if the data is more firmly tied to Australia, the services will be more likely to follow.

A.2.5 Australian Expenditure

The following is a description of the role of the Australian subsidiary, taken from the presentation given in Melbourne to Commonwealth officers.

A.2.5.1 Australian Subsidiary

The role of the subsidiary will be to perform all the support required by the customer locally. The company will recruit and train Australian nationals to form the subsidiary. A total of 6-7 staff are seen as the initial complement, with one manager, two analysts, three engineers (funded from the maintenance contract) and a secretary. The group will also make use of a variety of locally contracted services, and will be located as conveniently as possible for access to the customer site.

The subsidiary will be registered in Australia and comply with all local laws and regulations, whilst reporting back to the parent Cray organisation. The subsidiary will have access to Cray company proprietary material to be used in developing its expertise and assisting its customers.

The major activities of the subsidiary will be:

- i) Hardware and software maintenance
- ii) Customer support (1st and 2nd level)
- iii) Regional marketing
- iv) Local training
- v) Negotiation of contracts
- vi) Liaison with Cray organisation in USA, UK
- vii) South Pacific area development

A.2.5.2 Manpower Costing

The assumed make up of Manpower costs for the purpose of calculating Australian content are as follows:

- ° Salary (gross per head) AU\$ 40,000
- ° Overheads
 - Taxation
 - Expenses/Travel etc.
 - Training
 - Pension
 - Insurance
 - Medical Schemes
 - Profit Sharing
 - Rent
 - Services (utilities)
 - Recruitment

Say 50% to 100%

- ° Total say AU\$ 60K per annum at 6-7 staff (first 5 years)
AU\$ 80K per annum at 2 staff (over 5 years, if no further installations)

It is assumed that from mid 1986 the majority of this expenditure will be "Australian content". Expenditure by overseas staff in Australia will be balanced by Australian staff overseas for the initial training.

A.2.5.3

Local Content

From the purchase price of the system, an amount is essentially set aside to fund the establishment of a support operation locally for a new customer. In the case of a system in a new country the costs are normally between 10-15% of the purchase value and are expended over a period of approximately 3 years.

Local Content Calculation:

STAFF 3½ staff
(Manager, secretary, 2 analysts)
x 5 years = AU\$ 1.21 M
(5 years)

Additional costs over remaining
10 years life if no further sales

2 staff (Analyst/secretary/admin/
manager) x 5 years = AU\$ 0.80 M
(5-10 years)

AUSTRALIAN ONE-TIME COSTS (excluding salaries/overheads of UK staff)

- Site Planning/Preparation)
- Installation Expenses)
- Acceptance Tests)
- Bracknell Data Centre) AU\$ 0.20 M

AUSTRALIAN RECURRENT COSTS

- Overseas Visitors (from USA, UK)
- Assignees, Specialists
- Training AU\$ 0.15 M
(over 3 years)

TOTAL approx. AU\$ 1.5 M to
AU\$ 2.5 M
(over 5-10 yrs)

The above calculation represents the contribution to the Australian economy, of the expenditures in Australia by Cray's subsidiary in the support of the sale of the system to the Department of Defence. It does not include maintenance expenditure which is dealt with separately.

A.2.6

Software and Technology

Cray software is proprietary and supplied under licence with each system sale, for as long as the system remains with that customer. The major elements of the software provided with a system are:

- Cray Operating System (COS)
- Cray Assembly Language (CAL)
- Cray utilities
- Cray libraries
- Cray Fortran (CFT)
- Cray Pascal

There is no charge for the provision of the above, which is funded by a continuous reinvestment of 5% of the companies' revenue into the further development of these products. The value to date of the software investment is in excess of AU\$ 50 M, which if it were averaged across all sites of 80 is approximately AU\$ 600,000 per site. This is simply a reflection of the cost however and it is certainly true that the company would seek a 50% gross margin on software were it to be offered for sale. There is therefore a give-away of an amount equal to the cost. This giveaway continues after the sale, since money continues to be invested in software which continues to be distributed to customers.

We would therefore value the giveaway at an initial AU\$ 600,000 with an additional value of AU\$ 600,000 taking into account the future product enhancement over the next 4 to 5 years. As just one example of this software funding, is a project being established in the UK with Cray staff to modify to run under Folklore. The modifications will be distributed at no charge to Folklore users. Future projects of a similar nature are envisaged to ensure that the Folklore community sees the benefit of our software investment. Where it would be possible to locate such a project in Australia we will seek to do so, if the expertise exists and when the infrastructure is in place to manage such a project.

Of less direct benefit to present customers is our continued investment in hardware technology. Here a further 10% of revenue is reinvested, split between XMP family products and the Cray-2 project. In a sense however there is tangible value here, since the design and development teams have given us the capability to build a bi-polar memory XMP rather than with slower MOS memory. Not only are we building a more costly to manufacture bi-polar XMP, however, it is being offered at below the normal price for a MOS memory system.

Other miscellaneous items contributing to the technology transfer include the physical education and training materials, but this of course is backed by all the experience to date in Cray systems. We would claim a nominal AU\$ 50,000 for both Manuals and Documentation and Engineering Diagnostics. The investment in analysts and engineers is however far higher than this, and would more realistically be placed at AU\$ 100,000 per man (5 staff = AU\$ 500,000).

The total technology transfer would therefore appear to be valued at:

- Initial software	AU\$ 600,000	
- Future software	600,000	
- Hardware development	unknown	
- Education materials	50,000	
- Diagnostic materials	50,000	
- Expertise transferred	500,000	
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TOTAL	AU\$1,800,000	5 years

A.2.7

Maintenance

The Australian subsidiary will be responsible for all aspects of Hardware maintenance and will provide analyst support to the Commonwealth. The Analyst support will be provided for the first 3 man years of effort without charge. The subsidiary will however be employing 2 staff to cover this requirement for at least the first 2 years, and thereafter subject to review.

Hardware maintenance is contracted and charged for separately and will be performed by the Australian subsidiary. It is worth noting that the maintenance philosophy is to locate trained men on a customer's site, with sufficient diagnostic, repair capabilities and spares, to be almost entirely self-sufficient. This represents a unique style of maintenance which provides an exceptional level of local capability.

STAFF

- 3 engineers (at 60 K including overheads)
- Recruitment
- 12 months training (UK & USA) + expenses
- Share in local overhead
- Travel, communications costs
- Assignees to Australia (maximum 12 months, 2 staff)

SPARES

- Full set of spares (including modules) held locally
- National spares (major items) at Cray's expense
AU\$ 100,000
- Repair of modules on site
- Locally sourced consumables
- Local finance of spares holding
- Local insurance of spares
- Shipping (partial, where Australian carrier available)

OTHER

- Tools, Tester, Rigs, Scanners
- Diagnostics
- Remote Assistance

COSTS

- Approximately 50% of the maintenance expenses are related to the spares holding costs, and 50% related to staff

LOCAL CONTENT

- Approximately 50% of the maintenance revenue will be expended in Australia

A.2.8

Price

The equipment offered is at a significant discount to the standard price which is shown below:

list price XMP/12 with 2M words MOS memory	AU\$ 11,406,890
list price XMP/12 with 2M words Bipolar memory	AU\$ 12,039,390
DSD price XMP/12 with 2M words Bipolar memory	AU\$ 10,040,690
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DSD Benefit	AU\$ 1,998,700

A.2.9

Summary

There is a very major benefit given by the company in terms of the price of the equipment offered above. This is in recognition of the needs of the end user, within tight financial controls and a desire on the company's part to establish a significant presence in Australia.

We believe that the style of operation envisaged by the company will bring very significant technology transfer benefits, together with substantial expenditures locally over a period of years. The technology represented by the Cray is severely restricted in terms of our ability to export both the hardware and the application expertise, to overseas locations by the US government. The system is regarded as a key strategic capability.

The company is always prepared to consider purchase of components which meet our criteria for performance and cost. In our sector of the market there are few suppliers in the world and if we have overlooked any from an Australian source we will be pleased to evaluate them.

The application of the performance capabilities of the equipment is generally seen as more important than the expertise that goes into its construction. In other words it is what it lets you do, that you couldn't before, rather than how it is built.

It would seem advantageous to try and attract industries that could benefit by the use of Supercomputing techniques to Australian shores. The exploration industries are key strategic areas where a different policy which encouraged companies to process data locally, could be worthwhile.

Cray offers to participate in the provision of a shared computing facility, should other partners be found, to bring about early access to supercomputing for other Commonwealth departments. It is likely that the level of Cray's contribution would be of the order of AU\$ 250,000 per annum in terms of system and manpower expenses.

The following is a summary of the benefits discussed above.

DSD Price Benefit	AU\$ 1,998,700
Purchase price - local content	AU\$ 1,500,000 (3-5 yrs)
Software and Technology value	AU\$ 1,800,000 (3-5 yrs)
Maintenance - local content	AU\$ 1,200,000 (3-5 yrs)