

EXHIBITION PLACE

July 16, 2001

To: The Board of Governors of Exhibition Place

From: Dianne Young
General Manager & CEO

Subject: **Tri-Generation Study at National Trade Centre
And Install Air Conditioning at Automotive Building
Project No. 01-0014-10405**

Recommendations:

It is recommended that the Board:

1. Approve in principle the concept of the installation of a tri-generation plant for the NTC;
2. Authorize staff to take appropriate actions to seek financial/partnership arrangements to develop and construct this tri-generation plant over the next two years, at an estimated cost of \$4,835,000;
3. Proceed immediately with the air conditioning project for the Automotive Building with the existing approved capital budget of \$2,370,000 (\$1,250,000 for 2001 and \$1,120,000 for 2002); and
4. Approve the hiring of the Toronto Hydro Energy Services Inc. ("THESEI") as the full project consultants to the air-conditioning project through a design-build method at a fee not exceeding \$225,000.

Background:

The Board approved a budget of \$1,250,000 as part of the 2001 Capital Works Program, for Phase I of the air-conditioning project in the Automotive Building. As part of the same budget submission for 2001-2005 Capital Budget, the Board/City also approved a sum of \$1,120,000 for year 2002 as Phase II for the completion of this work.

Discussion:

Air-Conditioning Project in Automotive Building

The Automotive Building is one part of the NTC and is connected to the NTC by an underground

tunnel across Princes' Blvd. One of the Board's initiatives is to upgrade the Automotive Building to bring it in line with the Class "A" standards within the rest of the NTC. Improvements to this building would result in positive financial benefits for the Board.

A review by Pannell Kerr Foster Consulting Inc. in December 2000, of the rental potential of the Automotive Building, indicated that on completion of the above mentioned air-conditioning project and other minor upgrades, the Board has the potential to increase rental rates for this building. The consultant suggested that there was a potential to generate \$270,000 in additional annual net revenues on the basis of adding 6 new events. This would result in a payback period of 12 years based on a total cost for improvements of \$3,310,000.

In addition, to the revenue generation potential, there are cost avoidance/savings associated with the air-conditioning project. The original steam heating system in the Automotive Building is well over 30 years old. The distribution pipe system enclosed in a service tunnel under the ground floor is leaking and would require repair/replacement in either 2001 or 2002 at an estimated cost of \$350,000. Other components of the system may likely require repair in the near future at an unknown cost. Replacing the damaged heating plant would simply retain the status quo condition of the building. However, it is the intent that the air-conditioning project would not only upgrade the building but serve the dual purpose of providing heating as well. Both heating and air conditioning would be delivered in a more effective manner resulting in approximately \$75,000 energy savings each year associated with heating for the building.

Co-generation/Tri-generation Study Results

(a) Feasibility Study

With the aim of considering environmental aspects for every capital project at Exhibition Place, staff sought advice from Mr. Phillip Jessup, Executive Director of Toronto Atmospheric Fund ("TAF") in relation to the air-conditioning project. Because of the substantial budget for this project, Mr. Jessup suggested that Exhibition Place explore environmental initiatives such as co-generation or tri-generation. On advice from Mr. Jessup, Exhibition Place applied and in February 2001 was awarded a grant of \$40,000 for a feasibility study (i) to review economic plant options for supplying the heating, ventilation and air conditioning to the Automotive Building; and (ii) to link coincidental power and thermal loads via either a co-generation or tri-generation plant at the NTC. On approval of TAF, THESI was approved to provide the feasibility study.

Results of the feasibility study with respect to the plant options for supplying heating, ventilation and air conditioning to the Automotive Building indicated that it is possible to channel surplus heat and air conditioning from the existing NTC plant to the Automotive Building through duct and additional air handling equipment. The feasibility of this project is independent of whether or not a tri-generation/co-generation plant would proceed in future years. The cost of the piping and air handling equipment for the Automotive Building work is estimated at \$2,000,000, which includes \$225,000 for consultant fees.

With respect to the second part of the study – the feasibility of co-generation and tri-generation for the NTC – the study found that there were major benefits to Exhibition Place in energy cost savings

and reductions in carbon dioxide emissions. Co-generation/tri-generation is the conversion of a single fuel source into two or three useful energy products: co-generation producing (i) electricity and (ii) steam or hot water; trigeneration producing (i) electricity, (ii) steam or hot water, and (iii) chilled water (see Appendix 'A'). The idea is to utilize the waste heat that would normally be discarded (generated by the normal use of existing electrical equipment) recover this waste heat and convert it to a form of useful energy for the purpose of providing heating and air conditioning requirements.

(b) Benefits of the Trigeneration Project

The tri-generation plant proposed for the NTC would heat and cool the new halls within the NTC and the Automotive Building. The cost of this tri-generation plant is estimated at \$4,835,000 which cost could be repaid over a 10 year period in the savings in energy costs. Over a 25 year period it is estimated that a tri-generation project would achieve approximately \$16.0 in energy cost savings and reduce carbon dioxide emissions by over 8.38 million kg. annually. These are substantial benefits.

Description	Co-Generation System	Tri-Generation System
Project Cost	3,376,000	\$4,835,000
Payback	11 years	9.6 years
Internal Rate of Return	7.49%	9.33%
Co2 Emission Reduction	7,115,000	8,380,000 kg.

(c) Implementation of Tri-generation Project

Again, in consultation with both Mr. Jessup and THESI, it has been suggested that there are public and private sources to fund a tri-generation project either through the provisions of grants or by way of a loan with payments geared to the energy savings to be achieved.

As discussed above, the air-conditioning project for the Automotive Building which would result in the connection of the Automotive Building to the existing NTC plant is an independent project from the proposed future tri-generation plant at the NTC. However, given the results of the feasibility study, it makes economic sense and is in the best interest of the Board and City if both initiatives were undertaken. Therefore, staff are recommending that the air-conditioning project of the Automotive Building proceed immediately to complete it for the 2002 show season. Furthermore, staff commence discussions with TAF and THESI and other private and public organizations to develop a partnership to move forward with the NTC trigeneration project in 2002-2003 and report back to the Board no later than November 2001, on such discussions and proposals.

Consultant Proposal for Air-Conditioning Project

Following the completion of the feasibility in July, 2001, THESI was asked to provide a consultant proposal for the air-conditioning project for the Automotive Building. THESI is well equipped and

ideally suited to undertake the engineering design/build and project management work required by Exhibition Place. As an in-house service provider owned by the City of Toronto, THESI can offer a unique project approach to shareholder and associate organizations such as Exhibition Place, that would not be achievable through contracting a third party vendor.

To successfully deliver the air-conditioning project before the 2002 show season, THESI proposes the Citisource design build program, combined with an open book, full disclosure agreement to assist in satisfying the Exhibition Place procurement due diligence needs. The Citisource design build approach is a full service turn-key approach designed to fast track projects as well as ensuring project costs and schedule control. In addition, THESI will provide staff training for equipment operation and a one-year intensive commissioning period to ensure proper equipment operation.

THESI has put together a highly skilled team of individuals that come from various parts of the energy industry. The project/service team that will complete the work offers years of experience delivering energy services in electricity and gas, as well as, retrofit projects to various customers across North America. They draw upon previous work experience which includes electricity and gas procurement/brokering, energy analysis, mech./electrical design engineering, project implementation/management, commissioning and monitoring/verification at Honeywell, Johnson Controls, EIL/Tescor (Duke Energy), Energy Advantage, Rose (Vestar), Ontario Hydro, City of Mississauga and SNC Lavalin. This group has diverse experience and can offer alternatives to the traditional engineering and project management approach to deliver more value to Exhibition Place.

Staff are therefore recommending that we sole source the consultant work for the Automotive project to THESI given that it conducted the feasibility study; has expertise in the area; and is a City-owned enterprise. THESI has proposed that it would complete this design-build project at a maximum fee of \$225,000.

Conclusion:

This report recommends that the Board approve the concept of a tri-generation plant in the NTC; take appropriate action for the development of the project; proceed with the air-conditioning project for the Automotive Building; and engage THESI as project consultants for the Automotive project.

Contact:

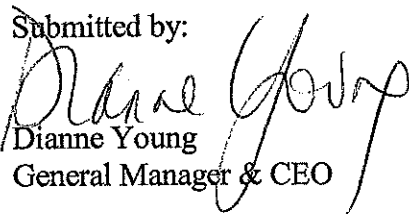
Danny Chui, Manager, Capital Works

Tel: 416-263-3670

Fax: 416-263-3686

Email: dchui@explace.on.ca

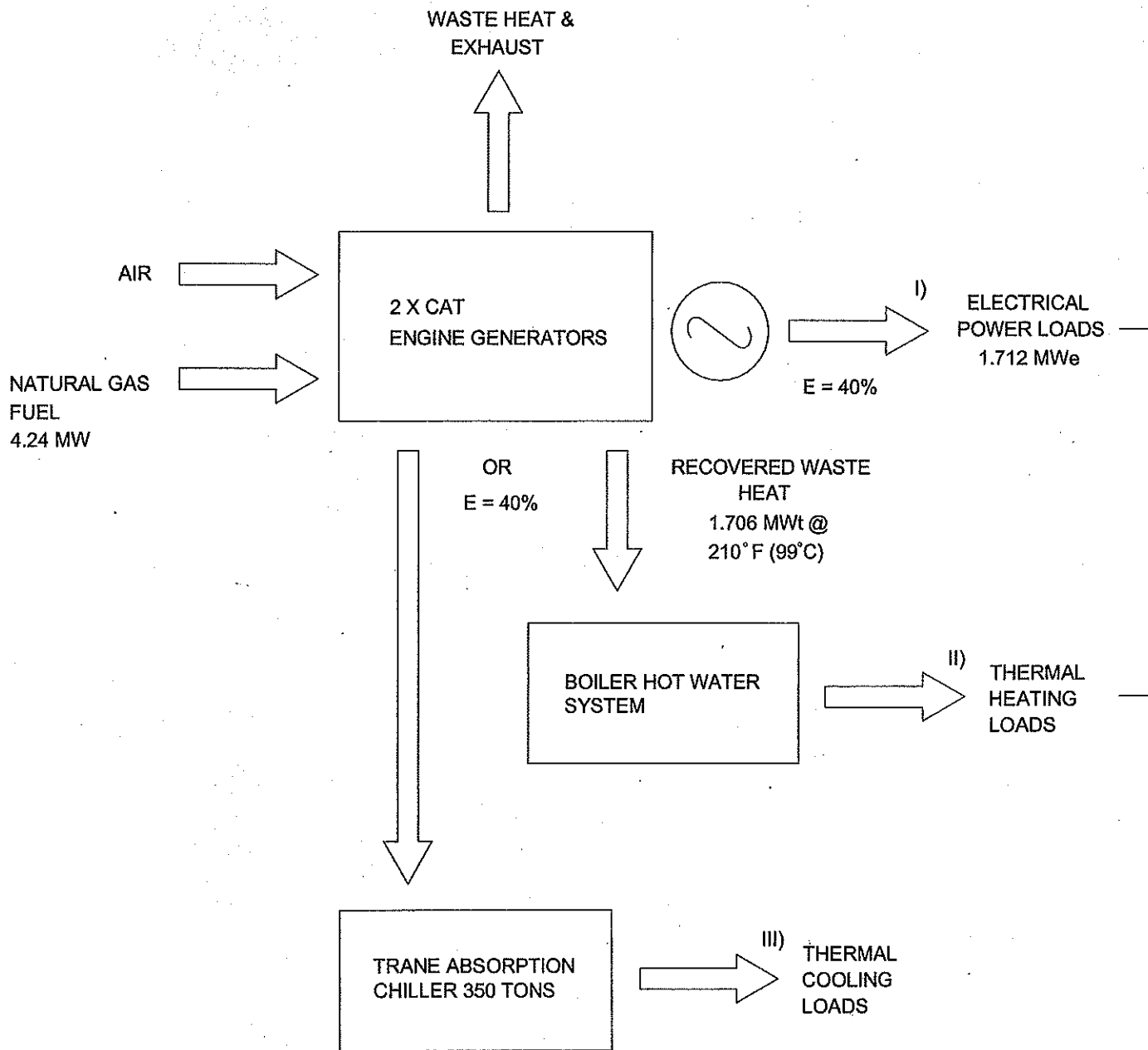
Submitted by:


Dianne Young

General Manager & CEO

CO-GENERATION / TRI-GENERATION CONFIGURATION

APPENDIX 'A'

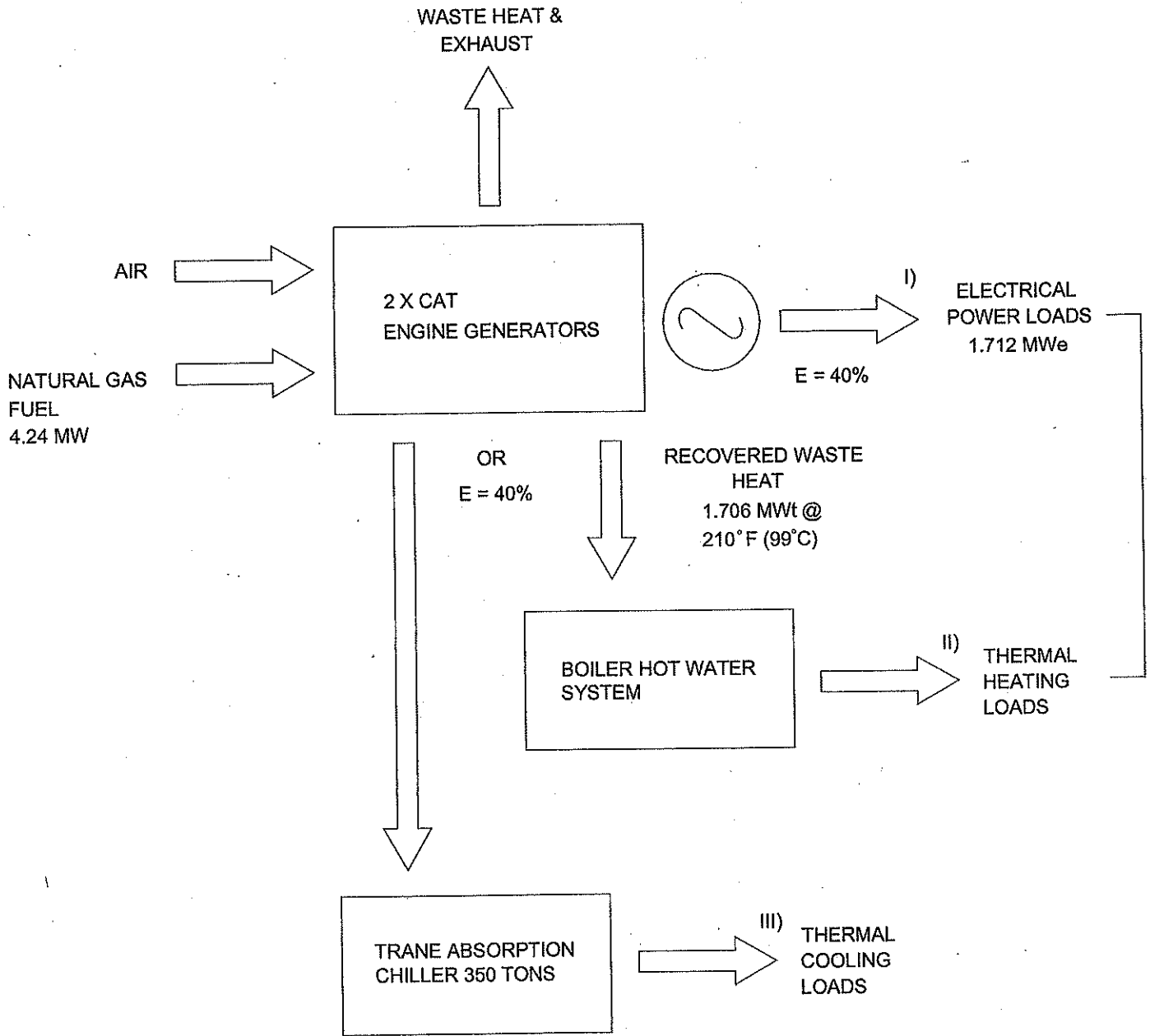


CO-GENERATION CONCEPT : I + II

TRI GENERATION CONCEPT: I + II + III

CO-GENERATION / TRI-GENERATION CONFIGURATION

APPENDIX 'A'



CO-GENERATION CONCEPT : I + II

TRI GENERATION CONCEPT: I + II + III