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13078

UNITED NATIONS INDUSTRIAL ORGANIZATION

PROJECT PROPOSAL

PART A - BASIC DATA

COUNTRY : Korea/Czechoslovakia/Poland

PROJECT NUMBER :

PROJECT TITLE : Development of Combustion Chamber of Automotive Diesel Engine with Low polluted Gas Emission
Twinning Agreement between the Korea Institute of Science and Technology, (KIST) Seoul, Korea and the Motor Car Research Institute (MCRI), Prague, Czechoslovakia and Institute of Thermal Engineering (ITE), Gliwice, Poland under the auspices of UNIDO

SCHEDULED START : July, 1990

SCHEDULED COMPLETION : June, 1991

ORIGIN AND DATE OF OFFICIAL REQUEST : 2nd October 1989

GOVERNMENT COUNTERPART AGENCIES :

UNIDO CONTRIBUTION : US \$ 10,000

GOVERNMENT CONTRIBUTION : Czechoslovakia: equivalent of US 10,600 in local Currency; Korea: equivalent of US \$ 10,600 in local currency; Hungary: eq: of US \$ 10,600 in local currency

CURRENCY REQUIRED FOR UNIDO INPUT : US \$ 10,000

CONVERTIBLE : US \$ 10,000

OTHER :

UNIDO SUBSTANTIVE BACK-STOPPING SECTION :

PROGRAMME COMPONENT CODE :

PROPOSAL SUBMITTED BY : 3 Institutions

DATE OF SUBMISSION :

PART B - NARRATIVE

1. Background and Justification

Air-pollution has become a serious global problem which must be tackled by all nations in the world. In particular, joint actions to speed up the development of low polluting and economical means of transport is necessary.

The population of vehicles registered worldwide is increasing rapidly particularly in developing countries. Among these, diesel vehicle population is relatively large since transportation of industrial products are carried out by vehicles in developing countries.

Greater parts of air pollution are thus originated by diesel vehicle in developing nation, creating a serious local problem particularly by NOx, CO and Smoke.

While emission control technology for gas engine is well developed and is available in market up to certain extent with reasonable price, emission control technology for diesel vehicle is not yet well established, even in developed nations. It is a time-consuming and costly development work, and until not even if technology treating the hazardous emission from diesel vehicle has developed to a certain extent, but it is not sufficient and not available in market at present. Since huge research fund is required for such kind of R & D work, it is desirable for developing nations to join efforts together to solve the diesel emission problems.

2. Special Consideration

In view of the fact that the nature of this project to solve the global air pollution problem, we strongly believe that world organization such as UNIDO should promote coordination and supports for this program.

3. Objectives

The main objective of this project is development of Combustion Chamber of D.I diesel with respect to low NOx and particulate emission and high fuel efficiency. Following research issues and respective services to industrial application in their own countries will be considered.

- Turbocharging system
- Fuel injection system
- Inter-cooling system
- Evaluation of measurement technology

4. Project Outputs

It is expected that through implementation of this project, both institutes will increase their capabilities in order to become focal points of innovation and technology improvement in their countries. The activities by the two research institutes, supported by UNIDO, are expected to produce:

- Direct Injection Combustion systems with the application of turbocharging and aftercooling technologies equipped with low pollution and high economy requirement.
- Production engines within 60 to 90KW power range, 4 cylinders in-line(6 in future) applicable to light and medium duty utility vehicles and trucks.
- Training and acquisition of experience in emission measuring and evaluation methods according to European and Japanese regulations as applied in Czechoslovakia and Korea respectively.

5. Project Activities

KAIST (Korea) has made some progresses on automotive engine combustion chamber which meets to Japanese 6 Mode emission regulation, and developed a high performance marine diesel engine.

MCRI (Czechoslovakia) has redesigned currently mid. Dia 102 mm engine to DI and TD, TDA, with BSFC of 220 g/kwh and emission levels well below 1990 ECE 49 limits. Application of equal combustion process to 92 mm bore engine with 4-cylinder power of 80 kw, BSFC below 225 g/kwh and 1990 emission limits also fulfilled.

In order to facilitate the attainment of the main objective of the project, both institutes, on the basis of the time schedule of the project inputs and budget available, will exchange researchers, train personnel, and organize a symposium and perform advisory services.

6. Project Input

UNIDO will provide US \$ 10,000 for the period July, 1990 June, 1992 in convertible currency and equivalent of US \$ 21,200 in local, non-convertible currency will be provided by the countries concerned (Korea: US \$ 10,600 and Czechoslovakia: US \$ 10,600).

7. Evaluation Plan

The project will be evaluated during the implementation and upon completion by the NGOs, Business and Industrial Institutions Co-operation Section, PDES and with participants from KAIST and MCRI.

8. Envisaged Follow-up

The first phase of this three-year project will end in Feb., 1993. After critical evaluation of research outcomes obtained during this phase, a long-term follow-up project will be considered by the NGOs, Business and Industrial Institutions Co-operation Section, and PDES.

PART C - CLEARANCE AND APPROVAL

Cleared by:

Date:

Date:

Approved by:

Date:

Amount approved

Source of Funds:

Convertible Currency:

Other

Date PAD requested:

5. Project Activities

The following activities will be undertaken to achieve the project objectives.

- (i) Visits of technical staff to study the techniques used in the other institutions, and to cooperate in the design of improved and combined techniques.
- (ii) Meetings of senior staff to arrange programmes and review progress.
- (iii) Exchange of monitoring equipment between the institutions.
- (iv) Exchange of used oil and wear debris samples between the three institutions to compare and correlate the results obtained by the different monitoring techniques, and to calibrate improved qualitative systems.
- (v) Organising training courses and symposia.

6. Project Input

UNIDO is asked to provide US \$ 60,000 for the period 1st April: 1990 to March 1992 in convertible currency, together with US \$ 30,000 for capital equipment as follows:

Rotary Particle Depositor (1)	US\$ 10,000
Particle Quantifier (2)	10,000
Optico-Magnetic Detector (2)	3,000
Computer Interface Units	6,000
Telefax machine	1,000
	<hr/>
	US\$ 30,000

Annex I

WORKING PLAN 1990/1991

1.	<u>Assignment of experts</u>	<u>Duration</u>	<u>Starting Date</u>
	Chief of project in each party will exchange visits to discuss R and D activities.	3 days	July 1990
2.	<u>Consultants</u>		
	Experts from both side will be exchanged according to the needs for the solution of specific problems.		July 1990
3.	<u>Mission</u>		
	The regular meeting on management level will be held in order to revise the current working plan and budget for the next year.		July 1990 in Seoul Nov. 1990 in Prague
4.	<u>Training</u>		
	Czechoslovakia researchers at KAIST, Seoul	2 men x 3 months	January 1991
	Korean researchers at MRI, Prague	2 men x 3 months	September 1991
5.	Periodic exchange of technical publications and standards.	Continuous	Immediately

Financial Contributions:

1. <u>Czechoslovakia:</u>	Duration of stay	Cost in equivalent of US \$
2 Korean researchers daily subsistence and accomodation	3 months	9,540.-
Allocation to project management, organization and evaluation		560.-
Miscellaneous		400.-
		<hr/> 10,600.-
2. <u>Korea</u>		
2 Czechoslovak researchers daily subsistence and accomodation	3 months	9,540.-
Allocation to project management, organization and evaluation		560.-
Miscellaneous		400.-
		<hr/> 10,600.-
		costs in convertible currency
3. <u>UNIDO</u>		
Round trip transportation costs for 4 (Korean/Czechoslovak) researchers (estimate)		5,800.-
Financial assistance to 4 participating researchers to cover extra costs		<hr/> 3,200.-
		<hr/> 10,000.-