

1 . 評価調査結果要約表 (英語)

Summary of Evaluation result

1. Outline of the Project		
Country : Socialist Republic of Vietnam		Project Title : Coal Mine Firedamp Gas Management Center Project
Issue / Sector : Mining		Cooperation Scheme : Technical Cooperation Project
Division in Charge : JICA Vietnam Office		Total Cost (at the time of Evaluation) : 800 Million yen
Cooperation Period	From April 1, 2001 to March 31, 2006	Partner Country's Implementation Organization : Institute of Mining Science and Technology (IMSAT)
		Supporting Organization in Japan : Japan Coal Energy Center (JCOAL)
<p>1-1. Background of the Project</p> <p>The government of Vietnam aims safety secured coal mine operation and maintenance and more coal production which meets the export demand in "Five year National Economy Development Plan (1996-2000). Also, "Coal Development Master Plan (1995-2000) estimates 15 million tons of coal production through the increase of production volume from 9.2 million tons (1996). In order to respond to this rapid increase of production volume, Vietnam is shifting the production method from open pit mining to underground mining. Currently, 40% of coal produced in Vietnam is from underground mines.</p> <p>On the other hand, explosion caused by mine firedamp gas in underground coal mines leads to frequent disasters.</p> <p>In order to solve this problem, in August 1998, the Vietnamese government requested the Japanese government for technical cooperation whose purpose is the improvement of mine safety technology in the Vietnamese coal mine sector through the following actions :</p> <ol style="list-style-type: none"> 1. Analysis and establishment of safety management standards and regulations for the management of explosive gas generation and the explosion-proof evaluation for the equipment utilized in underground coal mines. 2. Establishment of coal mine gas safety management center with modern facilities for the management of explosive gas generation and the explosion-proof evaluation. 3. Improvement of the ability of Vietnamese staff for the safety management of explosive gas and the explosion-proof evaluation. <p>2 . Project Overview</p> <p>(1) Overall Goal</p> <p>The safety technology is enhanced and disseminated in the Vietnamese coal industry.</p> <p>(3) Project Purpose</p> <p>Technical services concerning the coal mine firedamp gas safety management are offered to the Vietnamese coal industry by the Mine Safety Center.</p> <p>(4) Outputs</p> <ol style="list-style-type: none"> 0) The Center establishes the management system. <ol style="list-style-type: none"> 1) The Center acquires the ability to guide the in-situ gas content in coal seams evaluation technology. 2) The Center acquires the ability to guide the underground mine ventilation control technology based on the ventilation network analysis. 3) The Center acquires the ability to guide the underground mine monitoring technology. 4) The Center acquires the ability to execute the explosion-proof performance evaluation. 5) The Center acquires the ability to guide the rescue activity technology. 6) The Center acquires the ability to extend the education and training concerning the mine safety. 7) The Center in cooperation with VINACOAL acquires the ability to give consultation and advice on improvement and modernization of legal and organizational systems on coal mine firedamp gas safety management. 		

(5) Inputs (at the time of Evaluation)

(Japanese side)

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|---|---|
| 1) Long Term Experts : 8 experts in total | 2) Short Term Experts : 43 experts in total |
| 3) C/P Training in Japan : 22 C/Ps | 4) Provision of Equipments : equivalent 369.5 million yen |
| 5) Support for local cost expenditure | |

(Vietnamese side)

- 1) C/P allocation : 36 C/Ps in total (23 of them are C/Ps in technical fields.)
- 2) Provision of land, facilities, Project office, land for explosion-proof performance evaluation bord
- 3) Budget expenditure : Approximately 730 thousand US\$
(Salary, equipments, International telecommunication fee, fuel fee for Project vehicle, etc.)

2. Evaluation Team

Team Members	(1) Leader : (2) Technical Transfer Evaluation : (3) Evaluation of Coal Mine Safety Management : (4) Cooperation Planning : (5) Evaluation Analysis :	Fumio Kikuchi, Resident Representative, JICA Vietnam Office Mr. Atsushi Takekawa, Mine Safety Division, Nuclear and Industrial Safety Agency, Ministry of Economy, Trade and Industry Mr. Masakazu IKENAGA, Internal Affaires, Planning and Coordination, resources Department, Japan Coal Energy Center (JCOAL) Tomoni Adachi, Group II, Economic Development Department, JICA Yoshiko TAKAHASHI, CSJ Co., Ltd.
Period	9 th October, 2005 – 27 th October, 2005	Type of Evaluation : Final Evaluation

3. Summary of Evaluation**3-1 Summary of Evaluation Result****(1) Relevance**

Relevance is extremely high. The Project Purpose and Overall Goal are consistent with the needs of Target Group (Technical staffs of Mine Safety Center) and the policy of Vietnamese government. The actual coal production in 2004 largely surpassed the planned coal production of 2010 in the "Master Plan of Coal Industry Development 2003-2010, Vision to 2020" (Prime Ministers approval 20/2003/QD-TTg). And the ratio of underground coal mines will increase. Thus the importance of Mine Safety Management technology is increasing more than expected previously.

(2) Effectiveness

Effectiveness is extremely high. Eight (8) Outputs contributed to achieve Project Purpose directly and Project Purpose is likely to be achieved by the end of the Project as planned. One of the factors that contributed to achieve Project Purpose was Vietnamese strong ownership of the Project.

(3) Efficiency

Almost all the Inputs from both sides were as planned, except the delay of installation of the underground monitoring system and the permissible explosives test gallery.

According to the interview to the counterparts, most of the equipments have been utilized for the Project activities efficiently. One of the equipments provided by Japan containing Japanese language software, the counterparts had to operate with Japanese screen and English manuals.

Some equipment should be purchased in Vietnam, if it's possible to find agency in Vietnam. The main reason is that the C/Ps do not have enough experience in corresponding with foreign companies in case of trouble of equipment or procurement of spare parts, but it was still necessary to seek the possibility of not only the import from Japan but also local procurement in considering the import restriction.

(4) Impact

Since the duration of the Project is only five (5) years, more time is needed if Overall Goal is fully achieved. However, some performances on Objectively Verifiable Indicators of Overall Goal have been observed like that VINACOAL has made explosion-proof performance evaluation of equipments for underground

compulsory and proposed MOI the necessity of the mandatory evaluation.

(5) Sustainability

The present management system of the Center is effective to sustain the outcomes of the Project. According to the interview to CEO of VINACOAL; as the Supervising Agency of the Project, VINACOAL committed to support the Center continuously. In terms of financial viability of the Center, recently the number of requests for explosion-proof performance evaluation test has been increasing. MOI and VINACOAL allocated the budget for the construction of the new building. In terms of technical aspect, most of the counterparts have acquired basic skills and knowledge on gas safety management technologies and they started to provide technical services to the other coal mines.

3-2 Conclusion

The Project has already achieved almost all the Project Purpose sufficiently. It is expected to be completed successfully with the transfer of necessary technologies for coal mine gas safety management originally planned in the Project.

It was verified that coal mine safety center has already acquired almost all the technologies. Also, the technology transfer in the field of rescue activity was conducted to the staff of rescue center. It is appreciated to have conducted the technology transfer not limitedly by the original plan but based on the real situation, to right persons and organization.

And the improvement of security sense of the persons and organizations concerned due to not only the Project activities but also the ownership of Vietnamese side will be valued very highly. The Vietnamese side appears to have enough capability to pursue the outcome of the Project after the completion of the Project.

From the viewpoint of Overall Goal, in order to accomplish safety management of coal mines, it would be necessary to establish countermeasures for multiple safety management of not only firedamp gas but also other many risk factors such as spontaneous combustion, mine fire, water inrush, underground rock pressure and so on.

3-3 Recommendation

(1) Dissemination of the gas monitoring system

Through the Project, the underground mine gas monitoring systems have been installed to Mao Khe coal mine, the cooperation agency of the Project. This system can contribute to the prevention of disasters caused by the gas in underground coal mines. In order to spread the achievement of the Project across the country, it is hoped that the Vietnamese side could install this kind of system to underground coal mines as many as possible and as soon as possible.

(2) Development of all safety technologies

Gas management is only one part of all necessary technologies for the safety of coal mining sector. In order to develop the safety technologies, the Vietnamese side should continuously consider the countermeasures for such as water inrush, underground rock pressure, safety blasting, underground fire and so on.

3-3 Lessons Learned

(1). Procurement of Equipment

Through the Project, almost all of the equipments JICA procured are appropriate, but some of them had difficulty in the aspect of language for the utilization by Vietnamese persons. It is considered one cause that the specifications to procure the equipment were incomplete. In order to prevent same kind of mistake, it is one of the most effective methods that the persons who have enough experience for procurement of equipment in sector related to each project should check the specifications in advance of order.

(2). Plan and Implementation of project

Detail investigations are essential to make the plan of a project prior to the commencement of the project. But it is very difficult to conduct a survey completely in advance. In order to implement a project in line with the actual situation, if some change of the process or plan of the project are needed after the Project start, the related agency should discuss and modify the plan including PDM immediately.

(3). Implementation of PCM workshop

It is very effective and efficient to implement PCM workshop within six (6) months after the commencement of project in order to grasp the gap between the original plan and current situation.