Korea Experience Project Management Consortium on the U.S. Forces Korea Relocation Program

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Abstract
Program management is important for the successful completion of construction projects. The Korean government has encountered many problems such as poor cooperation, limited trust, and ineffective communications, often resulting in adversarial relationships between stakeholders, and thus poor project implementation in terms of time, cost, and quality. Organizations such as the Associated General Contractors of America, the American Society of Civil Engineering, and the Army Corps of Engineers have championed partnering through educational programs, workshops, and training manuals. However, few studies have conducted an empirical investigation of the process. Our aim was to leverage advantages for the product line construction of a mega military construction project using dedicated partnering based on a program management consortium (PMC) model and to implement an ongoing feedback program of best practice/lessons learned to minimize the mistakes made in sequenced construction. We discuss key developmental aspects of the United States Forces and a Korean relocation program management consortium. Our findings will benefit in the performance of the United States Forces, Korean relocation program management, and other large government-run public or private consortium-funded projects. They will also aid in the identification of new and creative ways to solve issues associated with the establishment of program management consortiums.

Keywords: Consortium; partnering; project management; project management consortium

1. Introduction
Recently, changes in the construction business environment have affected the way in which contracts are awarded; they are now based on a more advanced principal of partnership between the owner and main contractor. The concept of partnering is growing within the Army Corps of Engineers construction program as a dispute-avoidance tool and a new philosophy that changes the adversarial relationship with contractors to a collaborative team effort.

Partnering is based on open communications, the recognition of common goals, the identification of issues, and the establishment of a process for dispute resolution. It has been described as a tool to improve performance during the construction process and a way to create synergy and maximize the effectiveness of each participant's resources (Barlow and Cohen, 1997).

This partnering concept developed as the construction business became globalized through foreign funds, companies, and finance agency investment consortiums, which are linked by a common interest to program management companies. The establishment of project-oriented consortiums is an innovative and non-adversarial approach to international massive construction projects. Past projects have used various tools effectively and skillfully.

Over the last 10 years, the Korean government has encountered construction-related problems. During this time, it was involved in 14 capital projects. On average, the construction periods were delayed 3 years, and construction costs were over-budget by more than USD0.845 million (Table 1.).

The Korean government plans to undertake three new large projects: the Korean Peninsula Canal, reclamation of Se-Mangum, and Science/Business City. The government is currently reviewing alternative proposals from foreign investors, companies, and finance agency investment consortiums to obtain 40% of project funding from foreign countries.

The review and analysis of past practices and
lessons learned is important to formulate appropriate measures and initiate actions for improved practices for future Korean projects. For example, Korea needs strongly innovative delivery methods. The U.S. Forces Korea (USFK) Relocation Program may offer an opportunity to practice new delivery methods. This program involves a program management consortium of the Republic of Korea (ROK) and U.S. governments working together on a massive international construction project.

Successful program management consortium contracting will depend on the review of success factors that are used by the United States Forces and within Korean Relocation Program management.

First, fundamental changes are needed in mindsets, regulations, and legislation to allow a switch from traditional civil construction engineering procurement systems, which separated financing, design, construction, and operational functions.

Lessons learned from recent partnering projects should be incorporated in a formal redefinition of risk distribution and function allocation to reengineer the frameworks of roles and relationships in forthcoming multinational consortium-type initiatives. However, a multinational program management consortium (PMC) involves various social, political, economic, legal, and environmental dimensions.

In Korea, a PMC generally functions as a coordinator between the owner, architect or designer, and contractor to complete the construction process successfully. Specifically, a PMC makes a civil appeal and submits alternatives to the government claim (owner). This kind of partnership is widely accepted by academics and practitioners as an effective management tool to improve programs, quality, cost, and use of time, and to reduce confrontations between parties under very complicated circumstances, thus allowing an open and non-adversarial approach to project management. Consortiums have been introduced to Korean public funded programs that involve multinational parties, and some work more successfully than others in Korea.

We analyzed a case study and performed face-to-face interviews. We also monitored the results of PMC performance and identified the selection process used by the project management companies based on the Request for Proposal (RFP), Proposal, Program Management Services for Relocation of USFK installations task order, and Program Management Office (PMO) reports. We conducted a strength and weakness analysis by interviewing four industry partners: two clients (ROK/U.S.), a main contractor, and a consultant representative with hands-on experience in this partnering project.

To verify the reasonability of the interview results, we identified specific factors for the PMC or PMO: six major benefits, seven success factors, and three difficulties. These factors were incorporated into a questionnaire, which was completed by 120 surveyors (60 Koreans, 32 non-Koreans).

We also extensively reviewed the literature about project management and partnering, including books, journals, conference proceedings, seminars, workshop reports, Implementing Agreements (IAs), and Engineering Memorandums of Understanding (E-MOUs). Empirical data were collected from various sources to verify these findings.

2. USFK Relocation Program Overview

The USFK Base Relocation Program is an appropriate choice for planning, coordination, and control based on a project management (PM) framework because the program must meet time and cost limitations and comprises many large-scale projects that are carried out by the ROK and U.S. governments through cooperation and mutual agreements. The PMC must analyze the program's characteristics and complexities and thoroughly analyze the E-MOU between the ROK and U.S. governments. The PMC, with authority delegated from the owner, will then act to ensure that the program is executed to U.S. Department of Defense (DOD) standards within the time and cost frameworks approved by the owner.

Table 1. Cost escalation greater than US$500 M and delays in Korean projects funded only by government appropriation.
(Source: 2006 Parliamentary Inspection data)

| Project name                                      | Cost increase (millions of dollars) | Construction delay (days) |
|--------------------------------------------------|-------------------------------------|---------------------------|
| Si-Hwa Province Civil Construction                | 1.491                               | 3490                      |
| Young-Chen Dam Waterway                          | 1.356                               | 699                       |
| South Sea Great-Bridge                            | 2.214                               | 715                       |
| South Daejon Circulation Exp-Way                  | 0.951                               | 0                         |
| An-San New Town Phase 1                          | 0.943                               | 2163                      |
| Yong Daum Dam Civil Construction                  | 0.770                               | 591                       |
| An-San New Town Phase 1                          | 0.753                               | 1570                      |
| Jang-Hang Rail Roadbed Construction               | 0.684                               | 0                         |
| Su-Won–Chun-Ahn Rail Roadbed Construction         | 0.668                               | 1626                      |
| Dae-Jin Exp-Way, Part #9                         | 0.660                               | 354                       |
| Bi-Yeo–Non-San Road Construction                  | 0.573                               | 2770                      |
| Su-Won–Chun-Ahn Rail Construction                 | 0.552                               | 1623                      |
| Buk-An–Kung-Ju Road                              | 0.502                               | 1080                      |
| Dae-Jin Exp-Way, Part #4                         | 0.607                               | 0                         |

Note: Unit = 1 U.S. dollar, Exchange ratio: S: W= 1:1000

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2.1 Program Management Organization
The ROK Ministry of National Defense (MND) and USFK HQ have established a program through their design and construction agents (DCAs) to realign and relocate a substantial quantity of the U.S. military force. This program must accommodate the interests and the program and functional requirements of numerous ROK and U.S. organizations and agencies. The use of PM is expected to enhance the successful completion of the program with a minimum amount of manpower, at a desired level of quality, and within the prescribed budget and schedule, as agreed upon by the ROK and U.S. governments. To this end, the program will establish a PMO that includes the ROK DCA (MURO: MND USFK Base Relocation Office), and the U.S. DCA (FED: U.S. Army Corps of Engineers, Far East District). The DCAs will represent the two governments in carrying out program management within the PMO. The two DCAs will operate as one owner. The PMO will also include a contracted PMC. The goal is to establish a close partnering relationship between the PMC and the owner.

2.2 Site Location
The USFK Base Relocation site (Camp Humphreys) is located near the west coast of the Republic of Korea, approximately 3.1 km (5 miles) southwest of the city of Pyong-taek and approximately 56.3 km (35 miles) south of Seoul.

2.3 Funding Profiles
The program is funded primarily in accordance with the agreements and IAs of the Yong-san Relocation Plan (YRP) and the Land Partnership Plan (LPP) of the 2nd Infantry Division. The PMC’s scope of work will apply to both plans. In addition, the PMC will provide limited services to other projects funded by various sources such as U.S. Military Construction, Non-Appropriated Funds, Department of Defense

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*Fig.1. Location Map and Visual Zone

*Fig.2. Project Scope and Execution Conditions

*Fig.3. Funding Profile by Funding Source

*Note: Based on Funding Sources per Master Plan
Dependent Schools, Army and Air Force Exchange Service, Defense Commissary Agency, and ROK-funded construction projects.

2.4 Major Concerns of the PMC
- Protect proprietary information
- Evaluate/ensure value received
- Ensure fair sharing of risk by all parties
- Obtain/maintain total commitment
- Create a strong dependency on partnership
- Limit competitive market strategies
- Integrate differing company cultures

2.5 Selection and Contracting of the PMC
The USFK Relocation Program will rely on the selection of a suitable consortium partner, which will take place through a competitive tendering process. Contracts will be evaluated and awarded based on a source selection process as agreed between the ROK and U.S. governments.

2.6 Solicitation Procedures
The ROK and U.S. DCAs will jointly develop and agree to a common scope of work and selection criteria to evaluate prospective program management consortiums. Specific evaluation methods, criteria, and procedures for Request for Qualifications (RFQs) and RFPs shall be developed by action officers of the ROK and U.S. DCAs (DIA and FED) and approved by the Ad-hoc Subcommittee.

1. The ROK and U.S. DCAs will simultaneously release a public announcement with approved content; 15 days later, the ROK and U.S. DCAs will issue an RFQ to interested consortiums.
2. Interested consortiums will have 30 days after the RFQ release to submit their qualifications. A joint ROK-U.S. industry day will be held during the solicitation period to elaborate on the scope of the services and answer any questions from prospective firms/consortiums.
3. a) An RFP, like the RFQ, will be jointly developed by the ROK and U.S. DCAs, with agreement on a common scope of work and selection criteria. Work items to meet the particular needs of the ROK and U.S. governments will be developed independent of the common scope of work and will be included in the respective ROK and U.S. RFPs.
3. b) Separate ROK and U.S. RFPs will be issued to the consortiums that are recommended by the Program Management Selection Committee (PMSC) based on the evaluation structure listed in Table 2. Firms will have 40 days for proposal preparation and submission; after this time, firms will be invited to make an oral presentation to the PMSC.

3. Evaluation Methodology and Contract Awarding
Two PMSCs will be established: a PMSC for Qualification will be used to evaluate responses to the RFQ, and a PMSC for Proposal will evaluate responses to the RFP.

Table 2. Evaluation Categories and Weight

| Evaluation category | Evaluation weight |
|---------------------|-------------------|
| Cost control        | 20%               |
| Schedule control    | 20%               |
| Management          | 20%               |
| Quality             | 20%               |
| Safety              | 5%                |
| Responsiveness      | 15%               |
| Total               | 100%              |

a. Valuations of the qualifications and proposals will be scored using a point system.
b. The PMSC-Q will convene to independently review and evaluate qualifications in accordance with the submitted requirements of the RFQ and to score each consortium and respective member firms based on the agreed RFQ evaluation criteria. Each firm will be evaluated individually on their financial viability, technical abilities, qualifications of key corporate leaders, and past performance commensurate with their proposed role and share in the PCM. The PCM will be evaluated as a team in areas of organizational structure, capabilities, experience, and project understanding. The evaluation of individual firms and the team will be weighted at 50–50. The consortium will be ranked according to the total points received, which will be the total of the consortium's score as a team and the sum of each member firm within the consortium. The findings will be presented to the Chief Director for review and approval of the slate of consortiums. Any consortiums and member firms that are evaluated as qualified will be invited to submit proposals.
c. Upon receipt of proposals, the PMSC-P will be sequestered to review and evaluate proposals in accordance with the submittal requirements contained in the RFPs and will score each consortium based on the agreed RFP evaluation criteria. Evaluation will be based on how the PMC plans to execute program and project management in accordance with the scope of the work. In addition, the team evaluation will assess how the PMC intends to structure itself and staff the organization. Proposal evaluation will be based on the consortium's technical proposal, as well as its price proposal: overall, the evaluation will weight the technical proposal and the price proposal at 60% and 40%, respectively. The overall score, including scores from both technical and price proposal evaluations, will determine the ordered priority of negotiations. The results will be presented to the Chief Director of MND for review and approval of the ranked slate of consortiums. The ROK and U.S. governments will conduct negotiations and award contracts separately based on each nation's contracting regulations/laws.
d. During negotiations, ROK and U.S. negotiators will freely exchange information to produce a fair and reasonable contract that meets the intended
Requirements of both nations. After both the USA and ROK reach an agreement with a consortium, ROK and U.S. DCAs will award separate contracts for the agreed-upon scope of work.

e. If no agreement can be reached with the firms in the first-ranked consortium, negotiations will begin with the next highest ranked consortium.

f. Proposals submitted by the member firms of the consortium will be audited by respective ROK and U.S. governmental audit agencies to evaluate their financial capabilities and pre-award accounting systems.

4. Evaluation System

Evaluation will normally cover three main aspects: management plan, key personnel, and corporate past performance. PMC evaluation will be based on two categories: estimated performance and RFP results.

1. Estimated performance results
   Based on an estimated cost < 10 million won, proposals given > 90 points will be granted a bidding qualification. This evaluation will assess the engineers to take part in the project, performance results, credit rating, task duplication, R&D, investment results, etc.

2. Estimated RFP results
   Based on an estimated cost > 10 million won, proposals given 85 points will be subjected to an estimate of performance results. This will be based on the technical proposals that granted bidding qualification, including the understanding of the project, performance organization, performance plan, and performance support system (back-up system).

3. PMC performance capabilities will be investigated in-depth, including the construction engineering company, the construction company involved in the project along with their engineers, and performance results.

4.1 Program Management Responsibilities

To ensure that the system is suitable and incorporates appropriate manpower, program responsibilities and duties will be described in the Engineering Memorandum of Understanding between the ROK and U.S. governments, including appendices A: Master Planning Procedure; B: Program Management; C: Design Management; and D: Construction Management. For a detailed explanation of the organization and chain of work, see Fig.4.

4.2 Responsibilities of the ROK and U.S. Design Construction Agents (DCAs)

1. Report modifications to the PMC contract and Cost Management Joint Coordinating Group (JCG) by providing copies of the contract documents;
2. Report all other awards affecting the PMC;
3. Jointly oversee the PMC and coordinate contractual documents provided to their contractor(s) within the PMC;
4. Coordinate any guidance and/or direction given to their contractor(s) within the PMC;
5. Review and approve the proposed program management execution organization and plan submitted by the PMC;
6. Evaluate PMC performance quarterly and reach mutual agreement on the results, which will be used to determine the fee paid to the PMC;
7. Develop an efficient and cost effective strategy to produce criteria packages.

4.3 Responsibilities of the Program Management Consortium (PMC)

1. Operate as a team;
2. Determine the roles and responsibilities of the various different firms within the PMC as set out in the proposal;
3. Provide the ROK and U.S. DCAs with the consortium's method of billing the governments;
4. Provide professional program and PM methodology and the latest technology for various projects in the YRP and LPP, including master plan review, establishment of master program schedule, review of design criteria, establishment of project numbering system, development of work break-down system (WBS) and an integrated program management information system (PMIS), commission and...
turnover of completed facilities, project scope control and risk management, construction management and sequencing, quality control, cost estimating, program and project progress reporting; document management; and performance of special studies;

5. Coordinate approval of all value engineering proposals with the ROK and U.S. DCAs;

6. Provide capabilities to review and develop criteria packages and recommend, as appropriate, improvements to any ROK and U.S. design, construction, or acquisition strategy or processes to improve time and schedule efficiencies and cost savings;

7. Meet all requirements specified in both the ROK and U.S. contracts scope of work, including development of a master schedule and determination and recommendation of the best method to design and construct facilities;

8. Conduct monthly and quarterly program progress status meeting with the ROK and U.S. DCAs, respective users, and design and construction contractors.

5. Program Management Office (PMO)
The PMO will comprise the ROK DCA (MURO: MND USFK Base Relocation Office), and the U.S. DCA (FED: U.S. Army Corps of Engineers, Far East District). The DCAs will represent the two governments in carrying out program management within the PMO. The two DCAs will operate as one owner. The PMO will also involve a contracted PMC. The goal is for the owner and the PMC to develop a close partnering relationship.

5.1 Strength/Weakness Analysis
This analysis will assess the ability of in-house PMC manpower to adapt actively to new circumstances based on survey results using a 7-S analysis tool. The survey is directed at project-level teams and personnel. The survey asks respondents to compare the partnered project with past, non-partnered projects using a subjective scale from one to five, where one indicates "much worse" and five indicates "much better."

1. Analysis method
The McKinsey 7-S analysis method assesses "hard" variables, including strategy, structure, and system, and "soft" variables, including skill, style, staff, and shared values based on the quality of in-house organization and their requirements.

2. 7-S Analysis indices
- **Strategy**: Capacity for adapting and to new circumstances. This is evaluated using items such as long-term goals and plans, the resource allocation process, and the linkage of standards and goals used to conduct business.
- **Skill**: Types of strategy performance tools. This is evaluated based on levels of communication and encouragement among team members.
- **Structure**: Organizational structure and proper duty allocation and a correct understanding of roles for strategy performance.
- **System**: Maintenance of constancy to a specific decision-making process. This is evaluated based on the organization of the management system.
- **Staff**: Team members’ capabilities and specialties.
- **Style**: Team leadership and team members’ awareness.
- **Shared values**: Team members’ actions and plans for future team goal achievement (i.e., special standards, principles, sense of value, etc.).

(1) Strengths
Respondents identified six major benefits of PMC: 1) promotion of team spirit, 2) creation of a healthy working environment, 3) better communication, 4) mutual trust, 5) enhancement of problem solving techniques, and 6) minimization of abortive work. They also successfully adopted seven factors in their consortium: 1) a concept of gain share/pain share, 2) a win-win approach, 3) a high level of commitment (within the steering group), 4) mutual trust and respect.
5) efficient communication, 6) open mindedness, and 7) thorough understanding of the consortium at all levels.

(2) Weaknesses

Respondents identified three difficulties in common with previous projects: (1) cultural differences, (2) language barriers, and (3) achieving common goals/objectives. For these reasons, respondents also initially found it difficult to communicate openly, and it took some time for all parties to fully open up to one another.

6. Discussion

(1) Suitable Legal Foundation

The program will be arranged primarily in accordance with agreements and IAs of the two client representatives (ROK/USA) using a multinational PMC. Many countries have developed general laws and regulations and various official guidelines (e.g., Guidelines for PFI in the UK, ISTEA and State Registration in the USA). This project will apply legal problem-solving tools between Korea and the USA, such as an Umbrella Agreement (2004.12), ratification from ROK/U.S. Congresses, and an E-MOU (2005.7).

(2) Workable Procurement Process

Project management projects are much more complicated than traditional methods, especially when applied to this kind of multinational project. New challenges arise from markedly increased project variables, much longer time horizons, greater vulnerability to multidimensional external risks, and multiparty involvement with multiattribute success criteria. This project will ensure a workable procurement process through an organized multinational PMC. The PMC will act as the owner's principal agent in providing the services described in this agreement. The PMC will organize, lead, and manage the entire program. The PMC will work under the direction of the owner and will assist the owner in developing an integrated long-range capital improvement program.

The PMC will receive projects and priorities from the owner, allocate resources in accordance with those priorities, plan projects, determine the scope of work for the separate projects, and schedule and manage the implementation of those projects. The PMC will determine the packaging of the program into effective projects and contracts.

(3) Coordinating and Supportive Authority

The PMO will comprise the DCAs of the ROK (MURO: MND USFK Base Relocation Office), and the USA (FED: U.S. Army Corps of Engineers, Far East District). The DCAs will represent the two governments in carrying out program management within the PMO. The two DCAs will operate as one owner. The PMO will also involve a contracted PMC whose duties are outlined above. The goal is for the owner and the PMC to establish a close partnering relationship.

7. Conclusion

There is great demand for infrastructure facilities in Korea to meet increasing needs for economic and social development. The Korean government has issued a series of laws, regulations, and guidelines to attract and facilitate foreign investment. A number of experimental projects in diverse industries have successfully used various PMCs for Korea infrastructure development, but the application of PMCs in Korea is still in its infancy.

We have been investigating critical success factors and how Program Management Consortium projects can meet multinational needs. However, a study of how PMCs relate to macroeconomic values is still required. As the industry becomes more familiar with the concept of consortiums, more innovative aspects will need to be explored and embraced. The USFK Relocation Program in Korea is one example; because this PMC is managing a massive international construction project, it must address new needs.

The PMC will need to ensure proper communications based on strong relationships within each party, achieve common goals and objectives, protect proprietary information, evaluate/assure value received, ensure fair sharing of risk by all parties, obtain and maintain total commitment, create a strong dependency on partnership, limit competitive market strategies, and integrate differing national and company cultures.

Partnership is becoming a common practice in many projects. As partnering becomes more of a strategic initiative within owner organizations, a more commonsense approach will be applied to the implementation of plans and specifications.

Particularly in the public sector, officials will begin to take responsibility for making judgments about rules and regulations instead of deferring to others. However, it is important to keep in mind that partnering is not a panacea.

Fig.6. Results of the Analysis
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