COMSATS INSTITUTE OF INFORMATION TECHNOLOGY
DEPARTMENT OF MANAGEMENT SCIENCES

TERMINAL EXAM FALL SEMESTER 2006
SUBJECT: PROJECT MANAGEMENT

PROGRAM: MS
SEMESTER: 1
DATE: 12TH FEBRUARY 2007

TOTAL MARKS: 50
TIME ALLOWED: 3HOURS
NAME OF INSTRUCTOR: DR. AURANGZEB Z. KHAN

INSTRUCTIONS FOR ATTEMPTING PAPERS:

1. Carrying and use of digital diaries and calculators is not allowed.
2. Mobile phone will not be allowed in the examination hall.
3. Answer all questions
4. All question carry equal marks.
5. Admit card and student ID card is mandatory.

THE CASE

One of the major problems of our contemporary age which will become increasingly relevant in future, is satisfying the growing global demand for energy in order to keep pace with the consumption levels needed to sustain and expand rapid economic development and the growing affluence of societies. Developing states in particular, such as Pakistan and India, which have both witnessed a noticeable social transformation and a impressive economic growth in recent years, and which have been hailed by observers as being potential "economic superpowers" in the coming decades, are presently exploring several options available at their disposal to bridge prevailing acute and chronic energy shortfalls which threaten to impede their growth prospects.

Geo-political developments in Asia in the later part of the 20th century, notably the disintegration of the Soviet Union and the end of the Cold War, have created new opportunities for both Pakistan and India for cooperation in the energy field with some states in the region. The key event was the independence of the Central Asian Republics. As landlocked and comparatively poor and undeveloped states with low per capita incomes and social living standards, but extremely rich in energy resources, their geographic location in fairly close proximity to energy-deficient South Asia has opened the possibility for a long-term and mutually beneficial interaction between these two regions under which energy in the form of oil, gas and electricity is transported from Central Asia to Pakistan and India through pipelines and power transmission infrastructure. Such cooperation would enable the Central Asian Republics to not only supply the South Asian market, but it would also enable them to access new, eagerly sought after

consumer markets in the West, Japan and Far East, that is, by transporting their energy (oil, gas (in liquidified form)) from South Asian sea ports such as Gwadar. Traditionally, the export of Central Asian energy resources to markets in Eastern Europe has been controlled by Russia, though a number of projects to curtail this dependence and diversify export markets were initiated since the 1990s.

Eager to exploit its huge gas reserves, the Government of Turkmenistan took the initiative in 1991 and proposed the construction of a gas pipeline from Turkmenistan to Pakistan which would transit Afghanistan. The pipeline, to originate in south-east Turkmenistan at the Daulatabad gas fields, which reportedly may have the world's fifth largest natural gas deposits, would supply gas to Pakistan over several years at a price and in a quantity which would be fixed contractually.

Initial efforts created interest among international investors in this project. A consortium, led by the Argentine firm BRIDAS was formed, and joined by several interested entities. However, in 1995, the US firm UNOCAL signed an agreement with the Government of Turkmenistan to lead the pipeline project consortium.

The proposed project was iced following UNOCAL's decision to quit the consortium following a retaliatory US missile strike on an Al-Qaeeda terrorist training camp in Afghanistan 1998. Following the ouster in 2001 of the evil Saudi-, UAE- and Pakistan-backed Taliban regime in Afghanistan through US military intervention in the aftermath of the 9/11 attacks on the twin towers in New York City and the Pentagon in Washington D.C., interest in the project resurfaced.

In late December 2002, the Heads of State of Turkmenistan, Afghanistan and Pakistan signed an intergovernmental framework agreement defining the legal aspects of setting up a consortium to build the gas pipeline at their meeting in the Turkmenistani capital Asghabad. Earlier that year, on May 29-30th, 2002, the three leaders met in Islamabad and decided to set up a high-powered project steering committee comprising their federal ministers of petroleum resources to discuss technical, administrative and other issues relating to the proposed pipeline. Since its establishment, the committee has met at least nine times. At its meeting in Manila in 2003, the committee formally invited India to participate in the project, both as a purchaser of gas and as an investor. Subsequently, in May 2006, the Indian cabinet gave its formal approval for India to join the pipeline project. However, there is no guarantee that India will participate in the project. For its part, Afghanistan may purchase some of the gas transported by the pipeline at a future date.

Some technical assistance for the project is being provided by the Asian Development Bank, which has provided funding to the tune of US$ 1.0 – 1.5 million for the pipeline's feasibility study

undertaken by the British consulting firm Penspen (the resulting feasibility report was finalized, after incorporating some amendments, in 2005). The Bank also agreed to undertake a market study of market demand for Turkmen gas in Pakistan and northern India, as well as a risk analysis study of the proposed project. A study on potential gas storage sites in Pakistan was also undertaken.

According to current data - which varies depending on the source of the information used - the pipeline (Turkmenistan to Pakistan via Afghanistan section) will have a length of approximately 1,680 kilometers or 1000 miles. The pipeline diameter will be 56 inches and will transport gas at a working pressure of 100 atmospheres. The pipeline capacity will be 30 billion cubic meters of natural gas per annum. Six compressor stations will be constructed along the pipeline route. The cost of building the pipeline is estimated at US Dollars 2.5 – 3.0 billion. It is expected to take around 4 years to complete and will be operational for at least 25 – 30 years thereafter. In the event that the pipeline is extended to India, the pipeline may have to be extended by several hundred kilometers and the project cost will increase correspondingly.

Two pipeline route alternatives are under consideration: **(1)** (Turkmenistan) Daulatebad – (Afghanistan) Herat – Sokh Ab – Kandahar – (Pakistan) Chaman – Bostan – Dera Ghazi Khan – Multan – Haveli – (India) Fazilka and **(2)** (Turkmenistan) Daulatebad – (Afghanistan) Sheberghan – Mazar-i-Sharif – Pol-e-Khomri – Kabul – Jalalabad – (Pakistan) Peshawar – Rawalpindi – Lahore – (India) Amritsar. A map is provided with this examination paper showing the proposed pipeline routes.

Work will soon start after formation of the pipeline consortium, which will comprise several large international oil and gas companies as well as several companies from the host countries, and the finalization and signing of the requisite contractual agreements, including the price of the supplied Turkmen gas. Funding for this capital-intensive project will also have to be arranged.

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THE EXAMINATION

1) Assume you are the consultant who has been assigned the challenging responsibility of undertaking a comprehensive and insightful feasibility study for this proposed gas pipeline project by the Asian Development Bank. How would you go about it? What data and information would you need and which sources would you utilize? What (if any) quantitative and qualitative tools and techniques would you apply? Develop an outline for your feasibility report. (10 Marks).

2) Who are the stakeholders of this proposed gas pipeline project and what influence may they have on it? Develop and discuss a "stakeholder management strategy" to be followed by the project team. (10 Marks).

3) Risk is a crucial element of any project. What project-related risks are, in your assessment, relevant for this particular gas pipeline project at both the micro- and macro-levels? Assign priorities to your risks. Develop and discuss a "risk management strategy" to deal with these risks? Be specific and give examples. (10 Marks).

4) Let us assume, for simplicity's sake, that the pipeline project life-cycle consists of nine major phases (or activities) which are given in the table below along with relevant supporting information:

Project Phase	Relationship With Other Phases	Estimated Duration
(A): Finalization of Agreements with Consortium	Phase (A) has no preceding activity.	3 months
(B): Detailed survey and selection of best pipeline route	Phase (B) can commence after phase (A) has been completed	4 months
(C): Selection of project manager, project team and development of the detailed project plan	Phase (C) can commence after phase (A) has been completed	3 months
(D): Land Acquisition on the Pipeline Route	Phase (D) can commence after phase (A) has been completed	6 months

(E): Construction of the Pipeline	Phase (E) can commence after phases (B), (C) & (D) have all been completed	3 years
(F): Construction of Pipeline Compressor Stations	Phase (F) can commence one year after phase (E) has commenced, and must finish not later than 3 months before phase (E) is completed	6 months
(G): Construction of Pipeline Maintenance Stations	Phase (G) can commence 9 months after phase (E) has commenced, but must finish not later than 6 months before phase (E) is completed	4 months
(H): Installation of Pipeline Surveillance and Communications System	Phase (H) can commence anytime after phase (E) commences but must be completed no later than the completion date of phase (E)	9 months
(I): Final Testing, Synchronization of pipeline with existing gas pipeline infrastructure and Commissioning of Pipeline	Phase (I) can commence after the gas pipeline, pipeline compressor and maintenance stations, and pipeline surveillance and communication system, have all been completed.	2 months

On the basis of the information contained in the table, draw on a single sheet of paper a Gantt Chart depicting all the project phases, their relationships and - if applicable - the float which is available for each phase along with an indication of the duration of the available float. Identify the project's "critical phases". (10 Marks).

5) Should consideration be given to the variable "culture" in this pipeline project? What relevance may culture have? How would you, as the project manager, try to "manage" culture in the context of this project? (10 Marks).

(**Note to Examinees**: Please be specific and do not get lost in making ambiguous, generalized and case-unrelated statements about project management. Also, always keep the "big picture" in mind but be as focused as possible where the context requires it. Be creative and innovative. And remember: Quality is always preferred to quantity).