A thesis submitted to the Department of Environmental Sciences and Policy of Central European University in part fulfilment of the Degree of Master of Science

Placing EIA follow-up into the EMS structure of the organization

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July, 2009

Budapest

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ABSTRACT OF THESIS submitted by:
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for the degree of Master of Science and entitled: Placing EIA follow-up into the EMS structure of the organization.

Month and Year of submission: July, 2009.

Environmental Impact Assessment (EIA) for a long time has been a powerful tool in identification of the potential interference of the project activities with the natural environment and prediction of the consequences, either positive or negative, of this interaction. EIA follow-up, in turn, was designed to assess *actual* consequences of the development on the environment and identify areas for improvement of the EIA process itself. Environmental Management System (EMS), constituting a set of guiding principles, procedures and programs as well as management plans developed for the efficient management of the environmental aspects of the organisation's activities, could be considered as a logical sequel of the EIA. Present work targets to assess how properly implemented EIA follow-up could represent an effective link between the project's EIA and EMS of the organisation. Study carried out on the basis of the critical review of Environmental and Social Impact Assessments conducted by the Azerbaijan International Operating Company for the major oil and gas development projects in the Azerbaijan sector of the Caspian Sea and interviews with the environmental professionals working in this field in Azerbaijan revealed that in absence of formal EIA follow-up process, properly designed EMS is capable of substituting EIA follow-up with the embedded mechanism of continuous monitoring.

Keywords: Azerbaijan, Caspian Sea, EIA, EIA follow-up, EMS, ESIA, monitoring.

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List of Abbreviations

ACG	Azeri, Chirag and deepwater part of the Gunashli field in the Azerbaijani sector of the Caspian Sea
AIOC	Azerbaijan International Operating Company
AzSPU	Azerbaijan Strategic Performance Unit
BTC	Baku-Tbilisi-Ceyhan oil transporting pipeline
CA	Central Azeri offshore oil and gas producing platform
CEAA	Canadian Environmental Assessment Agency
COP	Chirag Oil Project
CTM	Compliance Task Manager
DWG	Deep Water Gunashli offshore oil and gas producing platform
EA	East Azeri offshore oil and gas producing platform
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMS	Environmental Management System
ESIA	Environmental and Social Impact Assessment
ESIS	Environmental and Social Impact Statement
FFD	Full Field Development Project
HSE	Health, Safety and Environment
IEMP	Integrated Environmental Monitoring Program
ISO	International Organisation for Standardization
MENR	Ministry of Ecology and Natural resources of Azerbaijan Republic
NGO	Non-governmental Organisations
Phases 1, 2, 3	1st, 2nd and 3rd phases of the ACG FFD project
PSA	Production Sharing Agreement (between Azerbaijan and AIOC)
PU	Performance Unit (BP division)
SCP	South Caucasus Pipeline (gas transporting)
SEA	Strategic Environmental Assessment
SER	State Ecological Examination
STU	Sewage Treatment Unit
SOCAR	State Oil Company of Azerbaijan Republic
WA	West Azeri offshore oil and gas producing platform
WREP	Western Route Export Pipeline (oil transporting)

1.0 INTRODUCTION

Environmental Impact Assessment (EIA) follow-up is a powerful tool to analyze overall efficiency of the EIA process itself, accuracy of the predictions of the project activities on the environment as well as effectiveness of the mitigation and monitoring measures mentioned in the Environmental Impact Statement (EIS) (Arts *et al.* 2001, Ramos *et al.* 2004). Taking into consideration level of inherent uncertainty present in all studies concerning predictions of the proposed development project on the natural environment, the necessity of the formalized EIA follow-up process is hard to overestimate. The same applies to the post project monitoring and evaluation of adequacy of the mitigation measures. The earlier flaw in the system is identified the easier it is to fix it through the implementation of the additional measures of redesign of the impacts control system.

EIA follow-up is a mandatory process included into the framework of the environmental legislation of many countries (Marshal *et al*. 2001, Morrison-Saunders *et al.* 2001). It is also often referred to as a best operational practice to be followed in order to ensure continual development of the EIA process and increase in overall quality of the Environmental Impacts Statements (Morrison-Saunders and Arts 2004, Jay *et al.* 2007, Glasson *et al.* 2005). However in many cases EIA follow-up is not applied as a standalone instrument.

The aim of the present work is to analyze efficiency of the Environmental Management System (EMS) being used as a substitute for the formal EIA follow-up process. The purpose is being achieved through the thorough study of the EIA follow-up practices applied for the evaluation of the major development projects in the oil and gas sector of the Azerbaijan economy in late 1990s – 2000s. BP Azerbaijan being the operator for the Azeri-Chirag-Gunashli (ACG) oilfield development project was studied as a case organization. Since EIA follow-up is not formally covered by the Azerbaijan national legislation, the

efficiency of the system used by the organization was evaluated in accordance with the best international practices. I have also attempted to examine the link that organizations' EMS establishes between international corporate environmental standards and transitioning national environmental legislation.

The working hypothesis is that EIA follow-up along with project ex-post evaluation and post-project monitoring is incorporated into the Environmental Management System utilized by the organization, and acts as a formal link between project EIA and operations EMS. Efficiency of the internal knowledge management system is analyzed to establish a framework for incorporation of the EIA lessons learned into the subsequent projects designs which are currently underway in the region. To assess the role of the EMS instruments and controls in the EIA follow-up process the link between project phase EMS and operations EMS as well as place of follow-up in the EMS structure needs to be examined.

BP Azerbaijan and particularly ACG full field development (FFD) project represents an ideal case for the initiated study because of the following:

- company was among the first ones to bring the internationally acknowledged and certified management systems to Azerbaijan;
- the development project was divided into 3 similar consecutive phases which makes the evolution of the system evident;
- different ESIAs for each of the projects phases were developed in accordance with international practices and in compliance with the Azerbaijan national legislation;
- there were reasonable time intervals between ESIAs to make follow-up study happen;
- environmental performance of the company is open and transparent.

It is very important to distinguish EIA follow-up, operational and post project monitoring. EIA follow-up deals with the quality and comprehensiveness of the EIA process,

identifies and addresses areas for improvement of the process (Arts 1998). Operational monitoring is designed to evaluate and to track compliance of the actual environmental performance of the organization to the legislation and conformance to the standards and predictions outlined in the EIS. Post-project monitoring should be able to produce actual environmental impacts data which is comparable with the baseline studies to assess real damage to the natural environment. While post-project monitoring is targeted to identify change in the environment occurred due to project activities; data obtained during operational routine monitoring should be able to reveal causes of these changes.

EMS proves to be a very capable tool to incorporate three processes mentioned above and to provide a link between monitoring and evaluation efforts and the commitments made in the Environmental Impacts Statement. The fact that the approach of interconnection of the EIA follow-up with the EMS did not capture proper attention in the relevant literature in the past, allows present work to contribute to the overall knowledge and practical experience sharing in the field of EMS applicability expansion. Nevertheless it must be noted that the idea of linking EIA with EMS through EIA follow-up was discussed in Eccleston and Smythe (2002), Ridgeway (2005), and Cherp (2008).

Being based on the practical experience of the commercial organization, current study did not involve analysis of the role of regulatory authorities in the process of EIA follow-up; however national legislation was reviewed and examined against contemporary international standards. However, due to the fact that all EIA activities are undertaken in close cooperation with the Ministry of Ecology and Natural Resources and that all available environmental legislation was reviewed in the course of present work, certain consideration is given for the improvement of the EIA legislative basis.

2.0 METHODOLOGY

In order to address the objectives of the current study precisely and to ensure accuracy and consistency of the data collected, research work was divided into six consecutive stages. In the first place literature review was conducted to ensure that research is based on the latest available studies in the relevant field. This phase incorporated review of the materials available on EIA follow-up and its place in the EMS structure, as well as assessment of Azerbaijan national environmental legislation. The second stage comprised review of the Environmental Impacts Statements for 3 similar development projects implemented by BP Azerbaijan as well as review and assessment of the environmental management system tools applied in the organization.

The third stage of the work was devoted to the interviews with the people involved in monitoring, EIA and EMS development for the company. Case studies that have been chosen on the basis of the information collected during the interviews were analyzed during the fourth stage of the research project. Subsequent analysis of the data collected and critical examination of the findings formed the fifth part of the research work and are presented in the "Discussion" section. During the sixth phase of the study, on the basis of the results obtained, a set of recommendations was developed to address areas for improvement and for further enhancement of the company's environmental management system.

2.1 Work plan

1. Acquisition of the initial background information on EIA post evaluation and follow up practices in the developed countries through the literature review;
2. Analysis of the Azerbaijan legislative framework for the environmental impact assessment in general and particularly for the monitoring and follow-up components:
    - review of the national legislative acts and procedures;

- review of the analytical literature on the subject of critical assessment of Azerbaijani environmental legislation.

3. Analysis of historical data and past EISs related to the BP development projects carried out by BP in Azerbaijan.
    - Review of the Environmental Impacts Statements for the Phase 1, Phase 2 and Phase 3 Azeri-Chirag-Gunashli offshore oilfield development project;
    - conducting interviews with the BP Azerbaijan environmental specialists;
4. Critical analysis of the established environmental management system in BP Azerbaijan's Strategic Performance Unit.
5. Collection of the most up-to-date information on the current state of EIA follow-up through observation of "lessons learned" sessions for the environmental impact assessment of the forthcoming oilfield development projects.
6. Analysis and collation of the data obtained. Compilation of the report.
7. Preparation of the recommendations.

2.2 Case Study: BP AzSPU ACG FFD project environmental impact statements review

Seven major Environmental and Social Impact Statements (ESIS) have been developed by the Azerbaijan International Operating Company (AIOC) and approved by the Ministry of Ecology and Natural Resources of Azerbaijan Republic (MENR) for the development projects carried out by BP in Azerbaijan: Early Oil Project (EOP), Produced Water[1] Injection Project, ACG Phase 1, ACG Phase 2, ACG Phase 3, Shah Deniz and BTC, and a number of smaller ESISs and addendums developed during 15 years of operations, but

[1] Produced water - water that naturally accompanies produced oil. Also known as produced formation water (AIOC 2002b).

in the course of the present work I focused on the evaluation and critical analysis of the EIA evaluation and follow-up parts of only 3 of them: ACG Phase 1, 2 and 3. The reason behind this is that development projects are almost identical with only minor discrepancies. The time gap between implementation of assessments and EISs approvals is around 1-2 years. Therefore these 3 documents present an ideal case for the assessment of follow-up programs and incorporation of the "lessons learned" to the design of each succeeding project. Study of the similar projects also allows us to evaluate how the management system adopted in the company was capable of incorporating findings of the monitoring and follow-up programs into the design of the next developments. ACG Full Field Development (FFD) Phases 1-3 Environmental Impacts Statements are available online, whereas the Environmental Management System was reviewed in the BP office in Baku. Study of the EMS was undertaken on the basis of review of relevant procedures, policies, web-based tools and audit reports.

ACG Phases 1-3 ESISs were reviewed to identify problematic issues that were repeated through all three assessment statements. Potential grey areas were identified during the observation of "lessons learned" sessions attended and preliminary interviews conducted prior to formal ones.

2.3 Interviews

Semi-structured interviews with the BP Azerbaijan environmental and legal professionals were conducted using a predefined set of questions to initiate and facilitate open discussion on the subjects of relevance concerning the EIA system in Azerbaijan, EIA follow-up processes within the organization and ex-post monitoring and evaluation of the major development projects. The list of interviewees was designed to grasp opinions from the representatives from diverse backgrounds within the environmental discipline, different

management levels, from the Performance Unit (PU) Environmental Advisors and Officers to Managers of the Health, Safety and Environment (HSE) departments, as well as from the representatives of the environmental departments of different PUs (offshore, onshore, exports). Interviews were conducted with 12 representatives of the company. Initially it was planned to interview all environmental personnel from BP AzSPU, who are dealing with ACG Phases 1, 2 and 3 ESIAs, or participated in development the mentioned ESIAs or were in process of conducting COP ESIA at the time of research. Unfortunately not all of them were available during May - June 2009; however the achieved coverage of the target group was around 90%.

Initial interview questions, designed to initiate the open discussion, included but were not limited to:

1. How would you describe the strength and weaknesses of the EIA system in Azerbaijan?
2. EIA follow-up and ex-post evaluation. What was/is being done regarding EIA follow-up in BP AzSPU?
3. What do you think can substitute formal EIA follow-up process for the scale of BP operations in Azerbaijan? /optional question in case if absence of formal EIA follow-up process was confirmed by the previous question/.
4. How are the accuracy of the impact predictions and relevance/efficiency of the mitigation measures proposed in the ESIA evaluated?
5. How does BP AzSPU's EMS address issues of EIA evaluation?
6. Who is responsible for the post project environmental monitoring/continuous monitoring?

7. According to PSA conditions all facilities will be handed over to SOCAR upon the expiration of the PSA. Will BP still have any liabilities for the monitoring of the post project phase?
8. How does BP involve local organizations in the process of monitoring of actual impacts of its operations on the environment?
9. What should be improved in the implementation of the process of environmental impact assessment in BP AzSPU?

It should be noted that even though certain questions are targeting same issues, not all of the questions were addressed to all interviewees, so there was no repetition of the questions. There are two major components of the present research work: documentation and system review, and in-depth interview. Being focused on the issues of EIA follow-up and its interference with the company EMS, topics discussed during the interview sessions also touched on general problems and issues with application of EIA in Azerbaijan, needs and recent developments in the field of national environmental legislation.

Interview outcomes, positions of respondents, selected citations and opinions, as well as comparative analysis of the information obtained from the interviewees are presented in the Results section (4.6) of the present work. It should be noted that in-depth interviews conducted proved to be the most valuable source of information on all issues with EIA follow-up and EMS implementation.

3.0 LITERATURE REVIEW

Present section is dedicated to the analysis of the literature available on the subject of EIA follow-up, its role in environmental performance of the company and its place in the environmental management system of the organizations. It is important to mention that despite the fact that it is publicly accepted that implementation of the EIA follow-up is crucial for the improvement of the overall quality of the all EIA processes and legislation, unfortunately EIA follow-up did not receive much attention in the relevant literature and number of authors and publications on this matter was pretty much limited in the recent years (Noble, 2000; Morrison-Saunders *et al* 2001; Ramos *et al.* 2004).

3.1 Environmental Impact Assessment definitions

There is no universally accepted definition of the Environmental Impact Assessment, but there are several basic criteria that have to be met in order to make EIA comprehensive and successful both in terms of getting necessary permits and approvals as well as to mitigate the stress on the natural environment. First of all EIA should identify and assess environmental, physical, biological and socio-economic impacts of the proposed development project in a logical form that allows rational decisions and predictions to be made (Turnbull 1991). It is also a procedure that ensures that the potential environmental consequences of the future development projects are understood, properly analyzed and considered before decision on sanctioning the project implementation is made (Carroll and Turpin 2002).

A widely used broad definition of the impact assessment is "prediction and estimation of the consequences of a current or proposed action (project, policy, technology)" (Vanclay and Bronstein 1995). Environmental Impact Assessment focuses mainly on the consequences for the environment and, to some extent, on the social and health state, while Environmental and Social Impact Assessment (ESIA) is a specific tool to deal with the project impacts on

both natural and anthropogenic environments. Ideally EIA is used as a decision-making tool, where feedback from EIA findings influences project design, location and other considerations (Glasson *et al.* 2005).

Strategic Environmental Assessment (SEA) broadens EIA area of application to comprehensive assessment of development plans, policies and programs on the local, national or international levels (Glasson *et al.* 2005). Product Lifecycle Assessment is a powerful tool to evaluate potential environmental impacts of new products throughout their entire lifecycle before sanctioning their production (Guinee 2002). We should also emphasize that Strategic Environmental Assessment and Product Lifecycle assessment although having similar features with EIA are subjects for separate studies and are not considered in the course of the present work.

3.2 What is EIA follow-up?

A key peculiarity about EIA is uncertainty as it conceptually deals with predictions and the future state, so EIA follow-up is designed to address these uncertainties. All permitting decisions are usually based on the predicted impacts and consequences, additionally all issues concerning environment are subjected to certain level of inherent uncertainty. If EIA deals with the issues on the theoretical level of predictions, EIA follow-up brings study to the practical level of real situation and actual outcomes of the project (Morrison-Saunders and Arts 2004).

According to Paula Caldwell (2004), General Director of the Canada Environmental Protection Service EIA follow-up is "a missing link between EIA decision making and continued project implementation. It's a key mechanism for feedback, learning from experience and adaptive management." Without some form of follow-up actual environmental outcomes of the development project and usefulness of EIA will remain unclear.

To ensure the accuracy of EIAs, overall quality of the Environmental Impacts Statements, adequacy of the proposed impacts management and mitigation tools in the project implementation and operation phases, as well as efficiency of prediction measures per se, formal mechanism of the EIA post evaluation and follow-up needs to be implemented (Arts *et al.* 2001, Ramos *et al.* 2004). However, several studies in this field still conclude that there is an urgent need for improvement, and that the absence of EIA follow-up process is a major weak point in the EIA practice and in EIA legislation of the majority of the countries (Arts 1998). It is very important to distinguish monitoring programs that are implemented during the project implementation phase and post-implementation evaluations carried out by the regulatory authorities from the formal EIA follow-up program as these activities even being intricately entangled into the one complex process, yet have different objectives and mechanism of implementation.

Implementation of EIA follow-up could be undertaken on three different levels or scales (Morrison-Saunders and Arts 2004, Ramos *et al.* 2004):

- Micro scale - monitoring and evaluation of specific components of the EIA process impact assessment, monitoring, audit of compliance, planning and implementation of mitigation measures, accuracy of predictions, etc;
- Macro scale – examination of the efficiency of the whole EIA system, i.e. how EIA processes affect project decision making and utility of EIA products;
- Meta scale – goes deeper than evaluation on the macro scale and answers the question whether EIA works or not in principle.

By any means EIA follow-up should consider cumulative effects of the development project and sustainability, which means that no project should be analyzed in isolation, when strategic or area-oriented approaches should be applied (Mayer *et al.* 2006, Morrison-Saunders *et al.* 2003). Understanding of the hazards of cumulative impacts is particularly

important because even individually minor impacts can result in significant damages over the longer period of time. Design of the follow-up program should reflect and be fit into the social, legislative and economic circumstances of the region (Morrison-Saunders *et al.* 2007). Additionally EIA follow-up program could and should be a tool to assure efficiency of ex-post monitoring program itself (Ramos *et al.* 2004).

3.3 The need for the EIA follow-up

The effectiveness of the entire EIA system on the development project's overall environmental performance is very much dependant on the incorporation of the formal "follow-up" mechanisms through, for example, environmental management systems or post-implementation monitoring schemes (Jay *et al.* 2007). Audit as a monitoring instrument is also among main tools to ensure that EIA process is efficient and omissions made in the certain EISs are taken into account in the following assessments. We need to distinguish EIA audit from the EIS "post-audit" since the first term is describing how effective the EIA process is and the second one is based on the EIS follow-up, i.e. identification of the lessons learned after the project is implemented (Ahammed and Nixon 2006). EIA and Strategic Impact Assessment follow-up mechanisms need to be designed and applied in such a way that ensures that feedback process is efficiently utilized in future decision making (Morrison-Saunders and Arts 2004).

In addition to the sound plan of decommissioning it is essential to have proper post project monitoring tools in place in order to ensure timely reaction and application of the adaptive measures to any unforeseen change. This involves both developments of comprehensive monitoring schemes as well as appropriate feedback mechanism for the adaptive response. Ex-post evaluation of the EIA process should include assessment of the process itself and communication of the lessons learned from the project to ensure that this

will add to the future assessments and developments (Arts 1998). After all success of the project development should be viewed only from the final result point of view, its environmental performance and what impacts it has caused to the environment (Marshall *et al.* 2005).

Results of the EIA follow-up should indicate how well assessment was implemented on the different stages of the process – from screening and scoping to consultations with stakeholders and negotiation of the final EIS with decision-makers. In addition, conduction of the EIA follow –up exercise is very useful to assess how approval conditions and recommendations were implemented and what value they have added to the project overall environmental performance (Dik and Morrison-Saunders 2002). Objectives and level of complexity of the EIA follow-up are very much determined by the body implementing follow-up activities, and are different for the internal checks carried out by the proponents and by 2nd party regulatory audits done by the EIA authorities (Birk and Noble 2009, Dik and Morrison-Saunders 2002). If follow-up process is initiated by the community concerned, it is a 3rd party follow-up and may be implemented in various ways including formal committees or concerned individuals having specialist or specific local knowledge (Morrison-Saunders *et al.* 2007). Quality of the final EIS is higher in case of broad involvement of public into the discussion because of three main reasons: expert knowledge is being publicly examined; secondly participation of the potentially affected people makes process fairer for them, and thirdly – social learning perspective (Webler *et al.* 1995).

If between 1970s-1990s focus of EIA follow-up was mainly on verification of the accuracy of impacts prediction and monitoring of the biophysical impact on the environment with the project proponents and regulators playing two different yet leading roles (Birk and Noble 2009); starting from 2000s there was a significant shift towards environmental management and community involvement (Arts and Van Lamoen 2005). Such socio-

economic issues like revenue sharing and communication between stakeholders are taking more and more attention in the follow-up programs (Noble and Storey 2005, Parsons and Barsi 2001). Also emphasis of the EIA monitoring is moving from the evaluation of impacts from the project implementation and construction phases to operations and decommissioning impacts (Glasson *et al.* 2005).

3.4 EIA follow-up and EMS

Since the EIA follow-up is primarily focused on the post-decision stage, especially through processes of monitoring and auditing, it is absolutely essential for tracking the real effects of project activities on environment and effects of the decisions made during the EIA process on the manageability of the aspects development activities. In addition to the fact that EIA follow-up is improving both process of assessment itself and environmental management of the project it also provides necessary incentives for advance of the regulatory permitting and enforcement processes (Glasson *et al.* 2005). Properly designed and implemented follow-up program not only allows to see consequences of the actions and decisions taken but also to implement corrective and mitigation measures to halt negative impacts on the environment in course of the implementation of the planned project activities (Arts *et al.* 2001).

Properly implemented EIA follow-up provides a good ground for the Environmental Management System (EMS) development for the company. Acting as a linkage between EIA and EMS, as well as between project implementation and operations phases, actual findings and learning from the follow-up process should be transferred into actions and cases for the EMS implementation matrices. For example post-implementation monitoring is usually included into the generic monitoring matrix for the operations and maintenance (Marshal *et al*. 2001, Morrison-Saunders *et al.* 2001).

In some cases inclusion of actions derived from the EIS into the monitoring scope under the operational EMS is the only method applied as follow-up process and post-implementation evaluation, this statement is elaborated further in the course of present study. While incorporating EIA into the EMS it is important to retain flexibility of the management system and maintain operational control over all its elements (Marshal *et al*. 2001). Practice of linking the EMS and EIA through the EIA follow-up was elaborated in the recent studies (Eccleston and Smythe 2002, Ridgeway 2005, Cherp 2008); however it is still a fruitful field for the research.

3.5 How does EIA follow-up work?

EIA follow-up is a complex process normally incorporating following key activities (Arts *et al.* 2001):

- Monitoring, i.e. collection of the system performance data and its comparison against pre-defined criteria or standards as well as against predicted or expected results (Arts and Nooteboom 1999). It is the most continuous activity in the entire follow-up process. In this respect monitoring on the meta-level, i.e. monitoring and evaluation of the monitoring program itself, represents particular interest for the study (Ramos *et al.* 2004);
- Evaluation, i.e. analysis of the information collected and appraisal of its conformance with the standards or predictions along with general environmental performance of the project. At this point quality of predictions and mitigation measures is being verified (Glasson et al. 2005);
- Management of compliance, i.e. decision-making and action taking against problems identified during the monitoring and evaluation stages;

- Communication, i.e. keeping stakeholders and all interested parties informed on the results of the EIA follow-up as well as on general results of the environmental performance of the project.

Figure 01 displays the linkage between EIA activities and development project design and implementation, as well as place of ex-post evaluation and monitoring EIA follow-up.

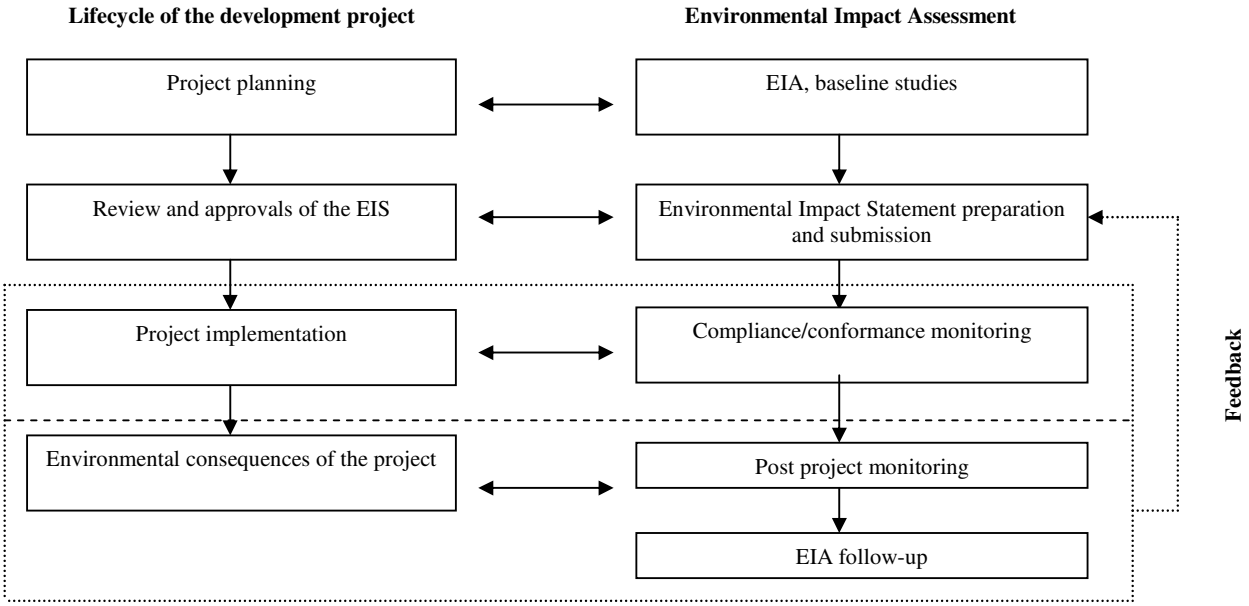

Fig 01. Project implementation and EIA follow-up.
Source: based on Arts et al. 2001

There is no disagreement among EIA practitioners that EIA follow-up should be considered and planned as early as possible, already at the screening and scoping stages (Arts and Van Lamoen 2005, Morrison-Saunders *et al.* 2005). There are different categories for the assessment of the need for the formal follow-up: level of complexity of the proposed activities, degree of uncertainty of the magnitude of potential impacts and mitigation measures, presence of new technologies, sensitivity of the natural environment in the area, societal and political issues connected to the implementation of the project, possibility for changes in the project design to occur during the implementation stage, various other risks e.g. failure in implementation of mitigation measures, human factor etc (Arts 1998; Meijer and

van Vilet 2000). Complex development projects, especially if there is a probability of repetition of the similar project in the future requires comprehensive EIA follow-up incorporated into the initial project design at the earliest stage possible (Fig. 02). Should screening exercise conclude that ex-post evaluation is needed financial and other resources should be allocated at the scoping stage (Meijer and van Vilet 2000). Denis (2002) suggests that careful scoping of the follow-up program is a key for the subsequent successful adaptation of the follow-up activities in case if it is required by the results of monitoring.

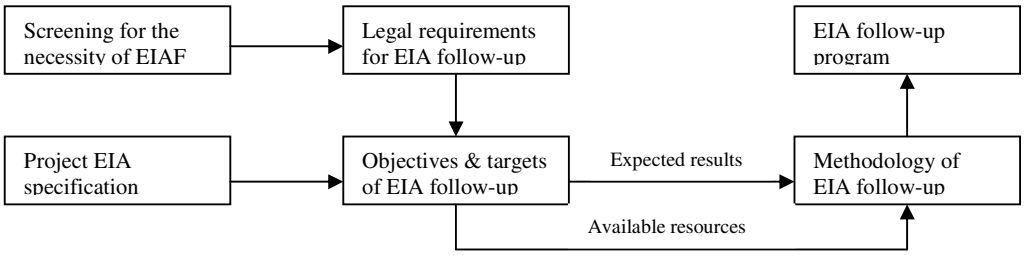

Fig. 02 Roadmap for EIA follow-up program.
Source: adopted from Morrison-Saunders and Arts 2004

One of the ground principles that are relevant to all follow-up programs is clear allocation of roles and responsibilities. Proponent of the change, or developer, should take a responsibility to conduct EIA follow-up and make sure that it is implemented to a certain standard meeting initially agreed objectives. Objectives should be agreed with state authorities that are responsible for supervision of both EIA and EIA follow-up processes. Community should be involved at all stages of the process. Clear and open communication would bring additional benefits through experience sharing and knowledge management, which is on its own one of the most important advantages of the EIA follow-up (Morrison-Saunders *et al.* 2007).

Public participation and open reporting of the follow-up outcomes and results as well as involvement of stakeholders at all stages of the process are very important contributors to the overall success of the follow-up program (Arts *et al.* 2001). Efficiency of the follow-up

activities is directly linked with the communication mechanism for future decision-making. It is very important to establish a baseline for comparison of the follow-up program results against it, so that verification of the efficiency of the mitigation measures is well supported by the baseline monitoring data and predictions (CEAA 2007).

Taking into consideration that EIA follow-up program and monitoring activities usually go much beyond the lifetime of the project (often after the decommissioning and restoration work is completed), recourses needed for the monitoring and evaluation activities are to be properly planned and budgeted at the earliest stage possible (Lee *et al*. 1999). Follow-up monitoring and project ex-post evaluation – main concerns are overall correlation of follow-up monitoring and monitoring of the operations stage and structure of the monitoring findings feedback process. Scheme, methodology and time framework for the ex-post evaluation of the EIA have to be sufficiently taken into consideration (Arts 1998).

Despite the number of different schemes developed for EIA ex-post monitoring, methodology of most of them is adopted from simple Pressure-State-Response (PSR) models and are based on the casualty chains (Ramos *et al.* 2004). However, those of the models taking into consideration not only environmental but also social and economic aspects do go beyond PSR models. One of the most commonly applied monitoring systems is ISO 14031 Environmental Performance Indicators system (ISO 1999), the downside of which is that it targets organization and its management structure during the monitoring program, rather than environment per se.

Indicators that are usually used for the comparison of the baseline monitoring data with the post implementation state should be able to provide a clear picture of significant environmental impacts; be simple in interpretation and trends indication; take into consideration uncertainty levels and require reasonable amount of resources (Jackson *et al.* 2000, Barber 1994, Noble 2000). Environmental indicators should also be capable to act as

early-warning signals and be an effective communication tool (Ramos *et al* 2004). Selective monitoring of the impact that were not included into the list of significant, thus not having detailed management program should be included into the follow-up monitoring program for contingency (Glasson *et al.* 2005).

3.6 Best international EIA follow-up practices: Netherlands and Canada

While EIA follow-up requirements are not yet included into the environmental legislation of most of the countries, Netherlands have a mandatory requirement to implement follow-up program for all EIAs. Netherlands follow the rule to include EIA follow-up into the scope *until* it is decided not to do this. While in most of the countries EIA follow-up is included into the scope only *if* it is decided so at the screening and scoping stages (Morrison-Saunders and Arts 2004). Section 7.9 of the Netherlands Environmental Management Act (2004) requires state authorities to determine scope of the EIA evaluation program at the consent decision-making stage. Netherlands were first to incorporate requirements for the EIA follow-up into the national laws and regulations, and to date have the most stringent and comprehensive follow-up and EIA evaluation system (Morrison-Saunders and Arts 2004). EIA system in Netherlands emphasizes particularly high level of public participation and utilizes independent EIA Commission to implement scoping of each particular EIA and participate in the EIA follow-up program (Glasson *et al.* 2005). However, availability of the strict regulations unfortunately does not guarantee implementation of the follow-up program. According to Arts and Meijer (2005), EIA follow-up study was initiated only in 16% of 376 sampled approved projects.

Dutch EIA follow-up legislation system suggests rather broad definition of the "environment", including not only biophysical environment of flora, fauna, habitats, air, water and soil, ecosystem, but also cultural and historical values and impact on the public health and

"quality of life". Economic issues are not included into the EIA legislation as such; however this remains up to the responsible parties whether to include economic considerations into the follow-up program (Morrison-Saunders and Arts 2004, *Environmental Management Act* 2004).

In the Canada case it is legally required to decide if follow-up is necessary at the screening stage of the EIA process. According to Canadian Environmental Assessment Plan (CEAA 2007), sections 16, 17 and 38: "Follow-up programs are mandatory for all projects assessed by a comprehensive study, mediation or review panel, but discretionary for projects assessed by screening". Sections 55-55.5 of the Canadian Environmental Assessment Registry regulate public participation in the EIA follow-up program, providing a framework for public web access to information on follow-up requirements and reports for all projects. Sections 20, 23 and 37 of the CEAA (2007) provide a delegation of roles and responsibilities for the EIA follow-up implementation as well as giving guidance on how the process will be supervised, i.e. responsibilities of federal authorities and provincial/territorial governments. Generally CEAA (2007) is an excellent guiding and regulating document for the EIA follow-up reference, providing all necessary regulations on financial assurance, public concerns, and issues regarding vulnerable environments, unproven technologies, cumulative effects, limited knowledge, as well as complexity and scope of the required follow-up program in all of the mentioned cases.

Coming to the role of the project developers in the EIA follow-up in Canada it is necessary to mention example of the mining industry which is now driving progress in the EIA follow-up activities and going beyond legal commitments. But as the EIA follow-up process continues to evolve so do the regulations in this field, shifting towards more emphasis on the socio-economic and effects on the local community (Birk and Noble 2009). It is also worth mentioning Canada's experience in involvement of indigenous communities at all

stages of the environmental assessment, including follow-up process (O'Faircheallaigh 2007). Having inherent knowledge and understanding of the local environment and adaptive techniques, participation of the indigenous communities brings additional value to the overall efficiency of the process (Brody 2000, Randall 2003).

3.7 Current EIA legislation and EIA practices in Azerbaijan

EIA legislation in Azerbaijan is still undergoing process of adaptation and incorporation of the international norms and practices. Currently environmental legislation features structure of old soviet-type State Ecological Expertise and Environmental Protection Law, yet recently developed EIA Handbook establishes basics for EIA in Azerbaijan (CENN 2004). Azerbaijani environmental legislation still lacks developed EIA system, however complex EIA studies are being implemented in the different sectors of the Azerbaijan economy. Most comprehensive EIAs were developed for the major oil and gas exploration projects by international operating companies, consultancy agencies and other international organizations. Present work is targeted to assess how these EIAs affected situation with EIA legislation in Azerbaijan and first of all how consequences of the undertaken development projects are being monitored and followed-up by the proponents. International funding agencies like United Nations Development Program, Asian Development Bank, European Bank of Reconstruction and Development provided financial and technical support themselves for delivery of EIAs for the projects funded by the mentioned institutions, thus acting towards development of the national EIA system (Bektashi and Cherp 2002).

Although, so called EIA Handbook, developed with the assistance from UNDP (1996) specifically for Azerbaijan had outlined ground rules for the classic EIA implementation and provided good guidance for the local and international companies working in Azerbaijan, old State Environmental Review regulation system inherited from the soviet times still remains

the only guiding document for decision-making on consent granting by the state authorities in Azerbaijan (MENR 2009). With regards to the post project monitoring and follow-up neither EIA Handbook (1996) nor Azerbaijan Republic Law on Environmental Protection (1999) does provide comprehensive instructions on monitoring, evaluation and management of follow-up activities.

Main environmental regulatory body in Azerbaijan is Ministry of Ecology and Natural Resources (MENR), established in 2001 and having four divisions: State Committee for Ecology, State Committee for Hydrometeorology, State Committee for Geology and State Forestry Committee. MENR is responsible for establishment and development of environmental legislation, policies and standards, as well as control for its fulfilment, and implementation of the requirements of the international conventions ratified by the Azerbaijan Republic. Review and approval of EIAs and Social Impact Assessments is also implemented by the MENR. Azerbaijan has acceded Espoo Convention (UNECE 1991) on Environmental Impact Assessment in a Transboundary Context in 1999 so all the major development projects implemented on the territory of Azerbaijan Republic and potentially impacting border zones or other countries have to go through formal EIA process, and final reports should be made available for the respected countries (AIOC 2004). It is important to mention that requirement for implementation of the EIA is prescribed in the Production Sharing Agreements signed with major developers in the energy sector and having force of the national law.

Azerbaijan being a country in transition requires a flexible EIA legislation system to address various goals of different development activities. At the same time there is a need for the internal feedback mechanism in order to ensure that EIA process is regularly updated in accordance with the latest developments in the international EIA practices (CENN 2004).

4.0 RESULTS

4.1 Introduction

The purpose of this part is to present information collected during the analysis of the ESISs implemented for the major development projects in the oil and gas sector of Azerbaijan Republic for presence of EIA follow-up process and EIA ex-post evaluation. The hypothesis was that all actions arose from the EIA obligations are addressed in the Environmental Management System of the proponent company (BP) and process of formal EIA follow-up and incorporation of "lessons learned" into the currently undertaken EIAs is being implemented, however it was not formally included into the past EIAs scope. This hypothesis was formed on the basis of the initial review of publicly available documentation, observation of the "ACG ESIAs lessons learned" session and previous work experience with the respective company.

4.2 BP Azerbaijan Strategic Performance Unit background information

BP Azerbaijan Strategic Performance Unit (AzSPU) operates in Azerbaijan, Georgia and Turkey. The major upstream projects include Azeri-Chirag-Gunashli (ACG) offshore oilfield development and Shah Deniz gas and condensate offshore field development in the Azerbaijani sector of the Caspian Sea. BP AzSPU also operates 3 midstream projects: Baku-Tbilisi-Ceyhan (BTC) oil export pipeline, connecting one of the biggest oil terminals in Europe, Sangachal Terminal, with the terminal in Turkish Mediterranean port Ceyhan; South Caucasus Pipeline (SCP), linking Baku gas fields with the gas distribution network hub in Erzurum (Turkey). Both pipelines are transiting hydrocarbons through Georgia, as does Western Route oil Export Pipeline (WREP) connecting Baku with the oil terminal in the Georgian port Supsa on the Black Sea (BP 2008).

BP started development of the ACG oilfield in the Caspian Sea with the potential ultimate recovery of more than 5 billion barrels of oil under the Production Sharing Agreement (PSA) with the government of Azerbaijan Republic signed in 1994. Anticipated plateau production from the Stage 1 of Shah Deniz project is 8.6 billion cubic meters of gas per year and approximately 45,000 barrels of condensate per day. Total gas recovery of around 180 billion cubic meters is expected from the Stage 1 development. All offshore installations are linked via subsea oil and gas pipelines with the onshore Sangachal terminal, which has processing capacity of 1.2 million bbl of oil and 0.04 billion cubic feet of gas per day. From this terminal oil and gas are being exported via BTC oil pipeline (1768 km long), WREP oil pipeline (830 km) and SCP gas pipeline (690 km) to the European energy markets (BP 2008). These projects are operated by BP on behalf of its co-ventures. AIOC member companies and their respective equity shares are provided in the Table 01:

Table 01. AIOC member companies (ACG PSA).

Company	Equity Share (%)	Country
BP	34.14	UK
Unocal	10.28	USA
SOCAR	10.00	Azerbaijan
LUKoil	10.00	Russia
Statoil	8.56	Norway
Exxon	8.00	USA
TPAO	6.75	Turkey
Devon Energy	5.63	USA
ITOCHU	3.92	Japan
Delta Hess	2.72	Saudi Arabia/UK

Source: AIOC 2002a.

For a number of years BP remains the leading foreign investor in Azerbaijan (SSCAR 2008).

4.3 Overview of the environmental legislative framework under which BP operates in Azerbaijan

BP in Azerbaijan operates under a number of production sharing agreements (PSAs) and host government agreements (HGAs) signed with the government of Azerbaijan. Most of

the environmental issues are addressed under the article XXVI of the ACG PSA (AIOC 2003), and in the relevant Environmental and Social Impacts Assessments specific for the each major project or in the Technical Notes approved by the Ministry of Ecology and Natural Resources of the Azerbaijan Republic. In addition to PSA (signed between AIOC and the government of the Azerbaijan Republic on the 20th of September, 1994) and ESIAs, HSE design standards were developed and approved by the AIOC for each phase of the Full Field Development program (FFD). Those aspects of the activities that are not covered by PSA or ESIAs are subject to the Azerbaijan national legislation and international conventions ratified by Azerbaijan. Since certain members of the AIOC were seeking funding from the international finance institutions, their rules and guidelines regarding environmental performance were also consulted (AIOC 2004).

4.4 EIA follow-up in the ESISs

Summary of the review of ACG FFD Phases 1-3 ESISs for presence of ESIA follow-up provisions and ESIA ex-post evaluation requirements is provided in the present section.

4.4.1 ACG FFD Phase 1 ESIA final report

Section 10.7.1 of the ACG FFD ESIA report (AIOC 2002a) is devoted to the impacts of the decommissioning stage of the project. However it is clearly stated from the beginning that: "The eventual abandonment of the ACG Phase 1 facilities will probably be conducted by SOCAR as the facilities are likely to have passed into SOCAR ownership by the time the Field Abandonment Plan is prepared." (AIOC 2002a). So the abandonment and reclamation plan presented in the ESIS is provisional (chapter 10.7) and is very much dependent on the State Oil Company of the Azerbaijan Republic (SOCAR) position towards decommissioning or continuation of the operations on the production facilities after 2024 (ACG PSA

termination date). It is also stated that preparation of the detailed abandonment plan should be started when 70% of the reservoir depletion is achieved.

Chapter 14 of the ACG FFD ESIA report (AIOC 2002a) addresses monitoring and mitigation measures. This chapter provides only a general pro-forma for the monitoring measures that will be undertaken throughout construction and operations phases, not touching the post-implementation phase. Section 14.3 links execution of the monitoring and mitigation measures with the company EMS, but does not indicate what monitoring responsibilities the operating company takes, and there is no monitoring matrix incorporated into the mentioned section. Taking into consideration the scale of the project - fabrication and installation of the production platform with drilling rig and subsea pipeline, as well as development of the onshore infrastructure; and scale of the aspects and impacts identified and evaluated in the specific section, absence of the detailed monitoring plan at the stage of project sanctioning is a significant deficiency of the studied ESIA. Chapter 12 studies cumulative impacts of the Full Field Development Project, placing the impacts from Phase 1 activities into the perspective of past EOP implementation impacts and future Phase 2 and 3 aspects.

So the review of the Phase 1 ACG FFD ESIA report concluded that there is no specific provisions made for the EIA follow-up, ex-post evaluation, post implementation monitoring and even the decommissioning and abandonment plan is not developed yet.

4.4.2 ACG FFD Phase 2 ESIA final report

Scope of the Phase 2 of ACG FFD included installation of 2 offshore platforms, 1 compression and water injection platform, 30” subsea offshore-onshore oil export pipeline and expansion of onshore support facilities at the Sangachal Terminal. As in case with Phase 1 ESIA there is no particular section or any link to the follow-up or ex-post evaluation of the ESIA process or post project monitoring. However post Phase 1 monitoring is mentioned in

the 12.3.4 section of the ESIS (AIOC 2002b): “Given the scale of the ACG FFD operations, Phase 2 will carefully consider the outputs from monitoring work completed as part of the Phase 1 studies and subsequently design monitoring programmes that ensure that the ecological status and trends in the receiving environment are adequately captured, in a way which allows the impact (or lack of impact) of FFD activities to be determined with the greatest possible confidence.” This again refers to the matter of inclusion of all monitoring activities into the company EMS. But in case of Phase 2 assessment there is at least a mentioning of the areas that will be monitored to assess impact that implementation of Phase 1 development had on the environment (AIOC 2002b): Sangachal Terminal area annual flora and fauna monitoring, survey in Sangachal bay, onshore wetlands survey, watershed modelling study, and offshore benthic survey.

Presence of the continuous monitoring philosophy is evident from the quote above, although monitoring plan is not detailed and there is an obvious lack of EIA follow-up in the report. No mechanism other than linkage to EMS is outlined, but this route will be evaluated on a later stage. It is also worth mentioning social monitoring which is outlined in the section 12.4 of the ACG FFD Phase 2 ESIA (AIOC 2002b). Social monitoring program is very well structured and includes mitigation and monitoring plan.

4.4.3 ACG FFD Phase 3 ESIA final report

Being the last one in the series of the ACG FFD ESIAs Phase 3 report (AIOC 2004) represents a very well structured and balanced document incorporating many omissions made in the previous impact statements. It allows me to say that even though there were no formal EIA follow-up mechanisms outlined in the reports, there were certain studies and feedback implemented towards improvement of the overall quality of the EISs. Concerning decommissioning phase, special provisions were made in the Phase 3 ESIS for the first time to

reflect Best Practicable Environmental Options and allocation of funds from all AIOC partners to carry out decommissioning and abandonment of the facilities. Section 10.4 deals with the decommissioning phase, providing high level guidance and reference documents and standards only. Methodology and specific program is stipulated to be designed on a later stage (on achievement of 70% reservoir depletion).

With regards to the monitoring, only project phase and operations phase monitoring were incorporated into the final statement. I.e. there was no post decommissioning monitoring indicated again. However, there is a linkage to the accuracy of predictions monitoring identified for the first time (AIOC 2004): "It *(monitoring)* can be used to verify predictions made in the ESIA, and prompt the development of further control measures if necessary. Monitoring can also highlight impacts or consequences of operations that were unknown at the time of writing the ESIA, or that have developed from a change in operations or the receiving environment."

As in case with the Phase 1 & 2 ESIS, mechanism of the EIA follow-up is not mentioned in the Phase 3 document, so it is concluded that formal EIA follow-up was not considered at the time of preparation and approval of the project documentation – 2001-2004. But, as was indicated above, there was significant improvement in the quality of the impacts statement identified, so the objective of the interviews shifts towards the evaluation of the mechanism how the improvement was achieved and what is the status of post-project monitoring, which also was not mentioned in the approved documents.

4.5 Role of EMS in the EIA follow-up and monitoring activities

4.5.1 Reflection of the BP AzSPU EMS structure in the ACG FFD ESIAs

Although mechanism of EIA follow-up and post-project monitoring itself are not specifically mentioned in the ACG FFD ESISs, monitoring and improvement of the EIA

system do occur. It became possible due to incorporation of the monitoring and learning from the mistakes principle into the EMS structure of the project and operations stages. Section 11.3 of the ACG FFD ESIS (AIOC 2004) refers to the Azeri Project Environmental and Social Management System and AzSPU Environmental Management System. So the construction phase of the project is managed within the Project ESMS framework and once operational – facilities fall under the Operations EMS structure (AIOC 2004). However, review of the available documentation and interviews conducted displayed that there is a missing link in the process, i.e. formal interface document or procedure between project ESMS and operations EMS. According to the ACG Phase 3 Environmental and Social Impact Statement, each phase of the ACG has to be ISO 14001 certified within the first 9 months of operations.

On one hand having specific ESMS for the project phase ensures that each following ESIA is prepared taking into consideration findings and lessons from the previous ones, in accordance with the "continual improvement" principle and Plan-Do-Check-Act paradigm of the EMS (ISO 1999). However on the other hand it might create additional barriers and area for miscommunication in terms of incorporating lessons learned from the operations phase into the ESIAs developed by the Projects group. This could happen if the communication, learning and feedback link between Operations and Project teams is missing. Interestingly, the Operations EMS does not include social component, where Project has environmental and social management system.

Another important thing is that BP has declared in all three ESISs reviewed the overall responsibility for the environmental compliance, although it will require significant effort from the contractors management point of view.

4.5.2 BP AzSPU operations EMS structure

Review of the BP AzSPU EMS structure has shown that company has a very well structured and managed ISO 14001 certified environmental management system covering all aspects of the company operations. Environmental Advisors are allocated for each of the installations both offshore and onshore, providing day-to-day environmental support for the routine and maintenance operations. Health, Safety and Environment Policy, Environmental Aspects and Impacts Registers, Annual Objectives and Targets as well as quarterly Management Programs are duly reviewed and approved. Specific monitoring program covers all the required as per PSA and ESIA conditions monitoring. Central Health, Safety and Environment Compliance Team has the overall responsibility for compliance assurance within the organization.

Having studied organizations charts and management procedures available for review I have concluded that there is no specific document covering EIA follow-up and ex-post evaluation, assessment of the accuracy of predictions and mitigation measures indicated in the approved ESIAs was found, but assigned ESIA Coordinator has the responsibility to ensure that all findings and lessons learned from the operations stage are taken into consideration in the future ESIAs. ESIA Coordinator organizationally seats under the projects team.

Another missing link is the bridging document between the project Environmental and Social Management System and Operations Environmental Management System. Neither of the documents reviewed provides a clear referencing of the procedures used by projects and operations, i.e. it is not always clear under which of the systems fall commissioning and start-up operations for example. Compliance Task Manager, being an integral part of the operations EMS provides a very good framework of all commitments and respective roles and responsibilities, acting as an advanced and comprehensive version of the legal compliance matrix.

EMS applied in BP has a tiered system of procedures, consisting of 5 tiers. Tier 1 procedures are applicable on the global or corporate level and Tier 5 has a local site or facility applicability. Hierarchy of the procedural documents seems to be very tangled from the first glance; however, in more close study it becomes evident that tiered structure is very rational and properly levelled. Procedures, practices and common processes applied on the corporate level are applicable to all organizational sub-divisions across the globe. This provides very good guidance and procedural grounds in locations where national environmental legislation is not yet developed. This practice ensures consistent approach to the environmental issues in developed and developing countries where Company operates.

Corporate reporting procedures and requirements applied in Azerbaijan SPU makes monitoring necessary even for parameters that are not regulated by the national legislation. However it must be noted that all monitoring requirements need to be modified in accordance to local peculiarities (e.g. ecotoxicological laboratory analyses carried out for drilling fluids and chemicals applied offshore are redesigned for Caspian endemic organisms, as well as dispersion models applied take into consideration close character of the inland water body).

4.6 Results of the interviews with the BP AzSPU environmental and legal professionals

To structure interview findings correctly I have grouped interviewees into the specific categories of "Site Environmental Advisors" who implement day-to-day support to the operations and "Management" who bears overall accountability for the environmental performance of the assets and "Central Support Function" who are responsible for provision of centralized general advice and guidance to all parts of the organization. In addition to this, interviews with ESIA Coordinator, the key person in the EIA follow-up in the BP AzSPU, and HSE Legal Advisor were conducted.

Answers on the interview questions and summaries of interviewees' comments are presented in the compiled version below, while names of the interviewees and dates of interviews are provided in the "Personal Communications" section of the present work. All interviews were conducted face-to-face in BP AzSPU offices in Baku, Azerbaijan. Analysis of the interviews is presented in the "Discussion" section of the present work.

4.6.1 Site Environmental Advisors

Central Azeri Offshore Platform Environmental Advisor

EIA process, as we know it now, was established in Azerbaijan in part owing to BP and other oil & gas majors. Before 1994 only SER did exist and covered all environmental matters. First full-scale EIAs carried out in accordance with the international standards were implemented in the energy production and transport infrastructure sectors of the economy. Public hearings for the first time were conducted at the same time. The main weakness was that results of public consultations were not taken into account. Design of the projects was very rarely amended due to the public comments and protest. Another weakness is that national EIA legislative system as such is not developed yet.

Till the last ESIA case, follow-up, as we understand it, was not conducted. Opinion of the people from the operations camp was not consulted and taken into consideration. Overall quality of the impact assessments is good, and operations Aspect and Impacts registers are being built on the basis of the A&I identified on the environmental assessment stage. System of EIA follow-up and ex-post evaluation is being implemented as a part of EMS implementation rather than as a part of ESIA commitment. Follow-up and evaluation of the mitigation measures was reinforced by the international financial institutions which acted as lenders in some of the projects. Compliance Task Manager, a specific tool developed for the monitoring of compliance is a key for identification and notification of the lessons to be

learned. With regards to the monitoring commitments – it is also a part of the EMS, which contains specific procedures regarding significant aspects and other issues (i.e. air emissions, waste management etc).

We implement annual ambient environment survey and compare it to the baseline data, but the downside of our practice is that in offshore operations monitoring system is less rigorous in comparison with the one applied onshore, while onshore impacts are considered to be less significant. Participation of local non-governmental organizations in the monitoring is rare, first of all due to lack of interest from them.

In the first place communication between projects and operations teams as well as external consultants and other stakeholders should be improved. Comments raised during the public consultation meetings are to be taken into account and, if necessary, amendments to the design need to be made.

Deep Water Gunashli Offshore Platform Environmental Advisor

From the legal perspective, first EIAs were initiated in mid 1990s, however, so called "Otsenka Vozdeystviya na Okrujayushuyu Sredu" (OVOS) was implemented since the soviet times. Format of the EIA is somewhat different from the OVOS format. One of the major weaknesses of the EIA system in Azerbaijan is that it is being applied very selectively: only to the major projects and those done by the international companies. Unfortunately I don't see mechanism of enforcement of the current EIA regulations.

With regards to what is being currently done in BP on the EIA follow-up matter, it is mainly discussions with Chirag Oil Project (COP) team. Number of learnings was communicated to the projects team. They have arranged good feedback sessions with the operations teams. Majority of the comments from operations people were accepted. Aspects and Impacts Registers, Annual Objectives and Targets, are being discussed regularly with the

engineers, maintenance and production people both offshore and onshore, managers. Through these sessions we prove and check accuracy and applicability of these documents. We can do same exercise with aspects and impacts identified in the ESIS.

Ideally, the EIA process itself should be carried out in close cooperation with the MENR representatives, who have influence over the process. Both EIA and the follow-up/ex-post evaluation processes should be implemented by the external consultancies and regulators to ensure that results of the evaluation are not biased. This is also applicable to the post project monitoring phase. Once all facilities are handed over to SOCAR and are accepted by them, SOCAR will bear all further liabilities.

Coming to the improvement of the EIA process, it is necessary to build local knowledge base, because most of the EIAs are currently done by the international consulting companies, who might not have full understanding of the Caspian environment. Workshops, trainings, educational programs should be implemented.

Chirag Offshore Platform Environmental Advisor

Significant weakness of the EIA system is lack of communication between project and operations teams. Many of the issues causing headache to the people from Operations are being put in the design again and again. This is known for years, but doesn't really change. However, there is a certain progress achieved with this matter recently. Regarding EIA follow-up process – we are only now starting to work on our mistakes, and the progress is not fast. Follow-up is being undertaken through EMS, or on case by case basis, e.g. in case of any shortcomings of the approved ESIAs we have to go through the formal assessment and approval process (through Technical Notes) for any small engineering modification or any discharge again to incorporate all omissions. This is a long and demanding process. Once you

start to operate what has been built, all errors do come obvious very soon, even without any formal follow-up.

For post-project monitoring we do have Integrated Monitoring Program, Compliance Task Manager, Tier 2 procedures. We work closely with the MENR and local institutions on the monitoring issues. Site specific environmental advisors are responsible for the day-to-day monitoring.

Communication system within the organization needs to be improved; use of external consultants should be minimized. Responsible for EIA people should talk to MENR, other regulatory authorities, construction and operations people not only on high level but also on the level of site advisors and even technicians should be consulted.

Istiglal Semisubmersible Drilling Rig Environmental Advisor

EIA system in Azerbaijan has a relatively short history of application. Only since mid 1990s with the development of the EIA Handbook assessments are being done in accordance with the international norms and standards. First EIA group on oil and gas sector was established in SOCAR in 1997.

EIA Coordinator is a key person in BP AzSPU structure and is responsible for the EIA follow-up and collection of lessons learned. However the process itself is not yet well established and properly formalized. In case of any additions that have to be made to the existing ESIAs or in case of minor developments we do prepare Technical Notes which are bearing similar structure with ESIAs. Specific group of specialists should be allocated with the sufficient budget and other resources to carry out all process required by the international EIA practice, with screening, scoping and follow-up exercises. Unfortunately there is no always enough time to undertake all the necessary action and to carry out EIA to the desirable quality standard.

Special formalized internal procedure is required for the EIA: dedicated teams working against realistic deadlines. Data collection and monitoring should be implemented properly. Format and procedure should be adhered to at all stages of the process.

East and West Azeri Offshore Platforms Environmental Advisor

Public and general awareness of the EIA system in Azerbaijan is extremely low. All construction and development companies with the huge scope of work are not aware of the legal requirements and EIA process. National legislation is not fully developed and due to low level of public interest and absence of enforcement mechanisms we end up either with no EIAs done at all or with poorly implemented assessments. But international companies, working in accordance to their own standards and procedures, do implement EIAs.

One of the main problems with the EIAs is that impacts statements are not always properly grounded on the thorough scientific research. Often the basis for prediction is unclear. Maybe the reason is in high costs for scientific research and monitoring.

In the BP AzSPU organizational structure Major Project group is responsible for the development of EIAs and follow-up. They do review of current performance against EIA predictions, collect information from the operations teams and match the actual results against the predicted ones. One of the major gaps in the Phase 1-3 ESIAs is lack of associated gas flaring minimization measures stated in the ESIS. I.e. if company is not legally bounded by the ESIA limits then, formally speaking, there are no incentives to undertake costly design modifications to minimize flaring. Waste management, hydrocarbons spills, emergency response are usually well-addressed in the ESIAs because of the developed industry policies and Company experience in similar type of operations.

Compliance Task Manager (CTM) as a part of EMS is the specific tool for the EIA follow-up. All measurable requirements are regulated by CTM, and here follow-up is done by

operations personnel on all levels, from technicians up to managers. IEMP is a well developed monitoring program which allows monitoring of almost all aspects of company activities offshore.

At the moment there is not enough management commitment to improve situation with EIA itself and EIA follow-up. We do capture lessons learned but unfortunately often there is no time and good will to act upon them and this results in repeated mistakes which costs us a lot. EIA process could be improved with proper planning, analysis of mistakes and gaps. General public and academia should display some interest in this matter as well.

4.6.2 Management

Offshore PU HSE Manager

Our company adheres to the international standards and local legislation in any country where it operates. According to PSA we should carry out environmental impact assessment for any project in the region - Azerbaijan, Georgia and Turkey. Our international practices and local experience fully address both impacts predictions and relevant mitigation measures. We do involve in the process of ESIA state regulatory authorities, external consultants and our AIOC partners. Consultations both with governmental organizations and parties as well as with non-governmental organizations are being organized on the regular basis. We follow ISO 14001 principle of continual improvement across all our operations. Starting from first EIAs implemented as early as 1996 local specificity was taken into account. But still there is a certain area for improvement in how we are doing ESIAs.

I am only aware of very few EIAs undertaken in Azerbaijan by local state or private organizations. BP brought significant experience to the country both in environmentally sound engineering solutions and in environmental assessment.

Usually estimated numbers of emissions and discharges that were stipulated in ESISs were considerably higher than actual, because the worst case scenario was taken as a basis for all predictions. This insured us from underestimation of the potential impacts but at the same time caused certain difficulties on the approval stage. We maintain continuous conversation with the SOCAR and MENR, conduct regular meetings and site visits. There is a common practice in the organization to ensure that lessons learned from previous EIAs are incorporated into the following ones. This involves coordination with the operations teams on the Define[2] stage of the project and peer reviews. Peer review is usually done at the last stage before sanctioning project, so it is a last chance to incorporate changes into design or into the final version of ESIS before it goes for approval.

Environmental aspects and impacts identified on the project stage are always included into the operations EMS Aspects and Impacts registers, thus going through thorough health check and follow-up by the operations. Review is being done on the annual basis. Among recommendations for improvement of the EIA system I would first of all mention close involvement of the operations and project engineering staff; enhancement of the information collections system; improvement in monitoring practices. Competence is a key. Joint database of all lessons learned from all operations around the world should be developed. But only experience from the similar locations and similar projects should be applied in case of projects in the Caspian region. Operability of the equipment should be tested and proven before including it into the design. Modern technology for mitigation of the environmental impact from oil and gas field development should be adopted for use in the Caspian. Legislation base should be improved to reflect specificity of Caspian Sea.

[2] Define – one of the Capital Value Process (project management tool applied in BP) stages: Appraise-Select-Define-Execute.

ACG PU Environmental Team Leader

Good news is that application of the EIA process in Azerbaijan is developing. In addition to this there is a certain succession trends noticed nowadays, and we can say that same rules are being applied for the same projects. However formal EIA follow-up is not being conducted – this is a major weakness of the system. ESIAs for the Phase 1 and 2 were done in isolation from the operations personnel and especially from the operations HSE team. This affected quality of the final products negatively. Another problem is that personnel on all organizational levels changes so quickly that we can not track any continuity in the approach to EIA development and follow-up.

There were a lot of lessons from the past EIAs and design errors captured on the operations phase, but there were no assurance tools to record and communicate them properly. We need to ensure that mitigation measures are implemented to the highest level possible and changes are incorporated into the design as far as practicable. At the moment ESIA Coordinator is a link that was missing for a long time – link between operations and projects team. He makes sure that lessons are captured and communicated to the ESIA team.

We can name many mistakes that were repeated from project to project. From the moment of Phase 1 start-up it was well understood that certain parts of the process are problematic: issues with sewage treatment units, produced water discharges occurring because of design problems, start-up flaring and commissioning phase discharges, all these issues were avoidable if not on the Phase 1, but at least on 2nd and 3rd Phases of FFD. Operations teams are dealing with the same problems and issues on the installations which are of the same design, and the fact that there was a 2-3 years time gap between those installations construction and deployment offshore tells for itself. This became possible only due to lack of communication. But operations team should take the responsibility to deliver the message to the projects and ensure that it is heard by them and acted upon. List of environmentally critical

equipment still was not incorporated into any of the designs; however this problem was voiced many times before.

There is no clear definition of roles and responsibilities – who is responsible for the follow-up and lessons learned capturing? Who is responsible for the same mistakes made again and again. EMS is a powerful tool, but there is no interface between project ESMS and operations EMS. No clear handover system "from projects to operations".

With regards to the monitoring issues – all monitoring physically is implemented by BP and its contractors, because offshore monitoring requires special tools and expertise as well as it is very costly. But all information regarding monitoring findings is publicly available.

First of all communication between operations and projects should be established. Engagement with the operations HSE team is crucial. Secondly, stress should be put on the real mitigation of the environmental impacts. This could be achieved through better planning, allocation of sufficient budget and time for EIA and EIA follow-up. Properly carried out design and assessment jobs could significantly contribute to the overall cost-efficiency of the business.

4.6.3 Central Support Function

Senior HSE Compliance Assurance Coordinator

Currently, formally speaking, there is no EIA legislation developed and approved in Azerbaijan. EIA handbook is only a guideline document which was never approved by the State Authorities. It was reviewed by the Ministry, but not approved; therefore it does not posses any legal force. Office of the State Ecological Examination which is separate from the Ministry of Ecology and Natural Resources official body, on the basis of their experience of EIA application in foreign companies, suggest certain amendments and updates to be

incorporated to the EIA handbook. In addition to this the only piece of legislation covering directly or indirectly issue of EIA is the State Environmental Protection Law (articles 50-58).

Unfortunately, there is no formal EIA follow-up practice in Azerbaijan. However, MENR implements inspections and audits of the projects, construction sites and operational facilities to confirm their compliance with the commitments made in EISs. In case of non-conformances identified, MENR can proceed with penalties. But these audits and inspections are not regular, and can not be treated as EIA follow-ups. There is also another issue with this: inspections are being undertaken by the MENR, when the official body responsible for EIA is the State Ecological Examination Office, which does not posses power to do audits.

In case of BP, there is a substitute procedure for formal EIA follow-up, which is a Compliance Task Manager. Nowadays, before submission of the EIA to the Ministry, "list of commitments" should be prepared. It is an internal document indicating compliance tasks and responsible parties.

With regards to the monitoring, there is a certain room for improvement in what is being included to the EIA under the monitoring requirements. These requirements do not always reflect actual environmental and ecosystems needs and often do not follow all the legislative commitments.

Once EIA is prepared and submitted to the MENR, Ministry initiates review of the document inviting board of experts from Academia, different research institutes, external consultants, SOCAR experts, NGO representatives. During review and consultation experts come up with the response which is being communicated to the proponent company. Upon incorporation of all the comments and changes MENR makes decision on sanctioning the project.

Proper legislation should be developed and approved, as well as a mechanism for the enhancement of the EIA regulations. MENR should pay more attention to the follow-up and ex-post evaluation; inspections and audits should be more regular and structured.

ESIA Coordinator

At the moment, ESIA group of the Major Project Performance Unit has completely revised and improved approach to the ESIA implementation. We thoroughly collected and reviewed all lessons learned from the past projects, and modern developments in international ESIA practice before commencement of work on the new COP ESIA.

EIA follow-up usually was carried out as an integral part of EMS and through negotiations of all operational matters with the Ministry (MENR). Compliance Team as well as Site Environmental Advisors were responsible for evaluation of past ESIAs. However this system did not work very well, unfortunately many findings did not receive proper attention form the project management teams.

To start with the process of COP ESIA we carried out series of knowledge management sessions with Offshore Environmental Team, Sangachal Terminal Environmental Team, Communications & External Affairs Team regarding all issues that have to be included in to be excluded from the ESIA process. We asked respective teams to update us on all lessons learned and on all matters that are currently being reviewed and are to be considered by the project design group. On the basis of initial feedback collected environmental teams involved applied to the engineering and maintenance teams for follow-up and carried-out similar sessions with them. In addition to this we have initiated research on all potential areas for improvement in the process of communication of the lessons learned to the project teams.

All above was done as part of scoping exercise for the new ESIA. We conducted meetings and awareness sessions with MENR, various non-governmental organizations and academia to collect initial feedback. Adopted non-technical introductory presentations were done for the general public and media.

Upon completion of the scoping exercise we started to collect detailed data on actual discharges and emissions from the current operations, carried out modelling. At this point both operations and project teams were involved. Draft chapters of the ESIS compiled by the consultant company were sent to the engineering and operations team for the detailed review and evaluation. After all changes were incorporated we implemented operational review sessions again and initiated second round of public consultations. All public comments were evaluated internally. The matter of translation of the final document before submission to the MENR has to be mentioned separately, as requiring specific level of attention. BP also applied to MENR for clarification and initiation of the necessary process regarding obligation under the Espoo Convention.

Overall, after completion of the proper follow-up and lessons learned evaluation exercises we are in a much better position to address all issues that were problematic in past ESIAs and project designed, which have caused problems at the stage of operations. Better monitoring data and emissions and discharges matrices are available; we have a much better understanding of how our operations affect Caspian ecosystems, most of all due to successes in continuous monitoring programs.

AzSPU HSE Legal Advisor

Inconsistency of the local EIA legislation with the international practices, lack of the relevant expertise of dealing with EIA documents on the regulatory side are among main weak sides of the EIA system in Azerbaijan. But the positive fact is that the government is moving

towards bringing its legislative framework to the level of much more consistency with the international standards. In addition to that, regular inspections and audits carried out by the officials definitely add certain structural change to the process of EIA implementation.

With regards to the EIA follow-up and post project monitoring: we have commitment under the PSA to come back to the baseline studies once the project is complete and check on the regular basis if any of the predicted or unpredicted negative consequences occur. In addition to the PSA this condition is also stated in the State Law on Environment Protection. Once facilities are handed over to SOCAR, there is no commitment on continuous monitoring; however should any damage to the environment caused by BP operation be revealed on post project phase, BP will have liabilities for that.

First of all coordination with the regulators should be improved, in some cases we have to seek advise from the MENR and SOCAR as they might be aware of many issues specific to the local conditions that we do not know about. When we come up with the international standards, only standards relevant to comparable projects should be applied rather than general industry practices. Commitments that we dive in the ESISs should be realistic.

HSE Compliance Senior Advisor

BP uses Compliance Task Manager (CTM) as one of the mechanisms for EIA follow-up. Implementation of the CTM system started in 2004 with the review of all applicable national and international legislation, standards and practices. This included, first of all, PSA and all ESIAs. We took ESIA and derived all that was looking as legal commitments to review and incorporate into the CTM structure. Ideally it should be done at the EIA preparation stage already and after that could be used as a basis for follow-up. Task verification on the BP Group level has been started in 2004.

In course of EIA development all legal commitments should be reviewed and only relevant ones should be incorporated into the EIA. Starting from 2004 we have initiated process of compilation of spreadsheets with tasks, defining roles and responsibilities, operational control measures and monitoring procedures for the commitments derived from ESIAs. Task verification is undertaken in consultation with the legal department and site environmental advisors. CTM is electronic, web-based system. Operational response for the follow-up task could be either "soft" – procedural or "hard" redesign of equipment or process. This is based on the manageability of the relevant aspect as well as degree of liability. Compilation of the CTM tasks could be placed to the "Plan" stage of the Plan-Do-Check-Act spiral, when actual EIA follow-up is being done when tasks are being verified and subsequently actioned by the responsible personnel in operations. Thus place of EIA follow-up in this case is at the "Do" stage.

We will still have certain liabilities on monitoring after expiration of the PSA. This is particularly valid for the Exports facilities; they have both social and environmental liabilities.

Waste Management Team Environmental and Social Advisor

One of the main weaknesses of the Azerbaijani EIA system is that it is mainly applied for the projects carried out by the international companies. I am not aware of any EIAs done for the projects carried out by the local private or public companies. Another major weakness is that once EIA is done and approved nobody actually checks if everything was implemented in accordance with the plan or not, nobody verifies accuracy of predictions and planning/implementation of the mitigation measures. But cascading experience from the international companies, local organizations start to implement environmental assessments not just with the purpose of getting permits from the regulators, but for own assurance purposes.

Only in the process of Phase 3 EIA certain improvements were made with regards to the follow-up from Phases 1 and 2 errors and lessons learned. The main problem here is insufficient involvement of the operations teams from the beginning, at the aspects and impacts assessment stage. Everything is being done very quickly, without proper time spending on scientific research, just in order to meet deadlines. When problems are discovered on the operations stage, as was in case with the offshore sewage treatment units (*this case study will be discussed later* - AM), it is already very hard to incorporate anything into the design. But since we have similar projects, we can prevent it from happening in the future. Unfortunately because of lack of the follow-up process it is not usually the case. There are a lot of examples – sewage units, produced water discharges, etc. Sufficient time should be allocated for environmental impacts assessment and internal reviews and approvals of EIS, this would allow operations to participate in aspects and impacts assessments, many reoccurring mistakes will be avoided. Thanks to the valid EMS process, all engineering personnel is very well aware of all environmental problems and is keen to act towards mitigation of the impacts on the environment.

EIA evaluation is only done through the operational monitoring and Integrated Monitoring Program. Local contractor companies are usually involved in the monitoring activities, a lot of attention is being paid for the capacity building and training of the national staff.

Lessons learned from the operations phase definitely need to be considered in the first place when designing new projects. Dedicated people from the operations team should be involved in order to use lessons learned as efficiently as possible. Interpretation of the monitoring data should be improved; this will positively affect understanding of the issues and evaluation of the EIA. Certain parts of the EIAs could be cut from the actual scope: because of similarity of the projects certain parts are simply being copy/pasted – like sections on

environmental description and operations description; while such important sections as aspects and impacts registers are not adequately covered.

4.7 Case studies

Analysis of three cases displaying issues that were identified and selected as examples of EIA follow-up practical experience in BP AzSPU is presented below. All three issues discussed fall under the ACG FFD Phases 1-3 ESISs and were pointed out during the interviews as areas of specific attention and concern.

4.7.1 Sewage Treatment Units on ACG offshore installations

Azeri platforms (Central, West and East Azeri) as well as Deepwater Gunashli (DWG) platform use identical electrochemical treatment units to treat the mixed effluent from toilets (black water) and showers (gray water) before it is discharged to the Caspian Sea. Electrochemical unit consists of a surge tank for the raw effluent, macerator pump to cut the solids, 2 electrolytic bookcells and an effluent tank for the treated effluent. The treated effluent is being discharged to the designated sewage caisson. Before the discharge it is diluted with cooling water to reduce the total residual chlorine to the acceptable level (threshold is provided in the approved ESIS). Grey water from kitchen and laundry plus macerated food waste are also discharged to the sewage caisson. The system is equipped with 2 sampling points – one immediately after the effluent tank to test the unit's performance and one on the dilution line to test the discharged effluent quality after dilution with the cooling water. There is a recycle line to return the solids remaining after the treatment from the effluent tank to the holding tank. The surge tank is equipped with a level control and it has an overflow line directly to the sewage caisson. The system is designed for 200 persons onboard (POB) on regular basis with short term peaks of up to 300 POB.

Electrochemical sewage treatment units on Central Azeri (CA) and West Azeri (WA) offshore platforms experienced first failures (outages of macerator pumps and bookcells) several times during the 2005. As a result of the failures the untreated sewage was discharged to the Caspian Sea which is a non-compliance case with the legislative requirements applicable to BP ACG Operations (ACG Production Sharing Agreement, ACG Phases 1, 2 and 3 Environmental and Social Impact Assessments). BP received a negative feedback and a claim for a fine from the Ministry of the Ecology and Natural Resources. In addition, the analysis of the treated effluent demonstrated that the treatment process does not consistently achieve the required effluent quality. The maintenance of the units in operational conditions requires significant amount of time and exposes the personnel involved to health risks and significantly increases risk of untreated sewage and chemicals spills. All 4 offshore platforms constructed and installed as a part of ACG FFD Phase 1, 2 and 3 were equipped with the same kind of sewage treatment systems (BP 2008).

Operational monitoring carried out as per clause 4.5.1 of the ISO 14001 EMS (ISO 2004) standard and in accordance with legal obligations and internal EMS procedures revealed 5 failure cases of the STUs during 2005 resulting in discharges of untreated sewage overboard. Investigation carried out by the operational maintenance team, vendor representatives and external consultants concluded that main cause of the problem was significant difference in water salinity levels between ocean water and brackish[3] water of the Caspian Sea. The offshore units installed on the ACG platforms were designed for use in the high water salinity environments. It should be mentioned that investigation has pointed out several other possible causes of the STU failures, absolute majority of which required replacement of the electrochemical STUs with ones utilizing completely different methods of

[3] Average salinity of the ocean water is between 3.1-3.8%, where salinity of the Caspian Sea water is 1.2% (Encyclopædia Britannica 2009).

sewage treatment. Caspian experience has shown that only units with biological membranes work well in the offshore environment.

Technical investigation findings and recommendations were presented to the leadership team at the regular Quarterly Environmental Performance Review meetings, which are organized in form of EMS Management Review sessions. Should the investigation and corrective actions be taken after the first failures on the CA platforms and changes incorporated into the Phase 2 and Phase 3 ESIAs and project design it would have been possible to avoid installation of same systems on the West Azeri, East Azeri and Deepwater Gunashli platforms. However at that time it was decided that problem could be solved with "soft" measures – amendment of maintenance and chemicals application procedure. During the year of 2007, 22 failure cases of the STU occurred on CA, WA, and EA. As no changes were done to the design of the platform systems at the end of Phase 3, organization ended up with the need to change 4 expensive STUs instead of one.

Case shown above displays that in absence of EIA follow-up and project ex-post evaluation, properly implemented environmental management systems can act as a substitute, revealing failures of the system and indicating problematic zones. Monitoring part of the EMS did work very well, when Management Review part, even being properly executed, did not result in the actions taken towards continual improvement of the system. At the moment all 4 sewage treatment units deployed offshore experience same problems as the first one and continuously contribute to the statistics of non-compliances. Positive news is that electrochemical treatment units are not included into the design of COP platform, mainly because of the formal follow-up process undertaken for the first time during preparation of the COP ESIA.

4.7.2 Produced Water Discharges from the ACG offshore installations

Peak of daily generation of produced water mentioned in the Phase 1 ESIA was estimated to be around 100,000 barrels. This calculation was updated in the Phase 2 ESIA to approximately 39,500 barrels per day as a total volume for East Azeri, West Azeri and Central Azeri. This significant reduction was made after detailed review of the most updated geological and reservoir modelling data. This is one of the few EIA follow-ups that were done for the Phase 1 ESIA.

As per design specification for the produced water injection systems for Phase 1 and Phase 2 offshore facilities, the availability of the system was declared to reach 95% level, with an estimated 5% downtime. As the project description in the respective ESIAs did not provide more information than this, the ESIA authors consequently assumed that this implied that if the systems were unavailable for 5% of the time then 5% of the total water production volume would be discharged to sea. On the basis of the Phase 3 ESIA predictions (taking into account 95% water injection availability for Azeri platforms, and 98% system availability for the Deep Water Gunashli platform), this implied that Phases 1, 2 and 3 would discharge a combined volume of about 7.2 million barrels per year at peak production (the Phase 2 ESIA predicted just under 3.5 million barrels per year from East and West Azeri alone).

The produced water disposal project initiated as a Phases 1 and 2 ESIAs follow-up exercise, re-examined water production predictions further; assuming the 95% separation design specification for the offshore separators, estimates of water coming onshore ranged from 25,000 to 125,000 barrels per day, with a "most likely" peak value of 80,000 barrels per day. The produced water disposal pipeline was designed to handle 80,000 barrels per day. If this represents 5% of the total production, it would imply a total offshore water production rate of about 1 million barrels per day. The produced water disposal ESIA was slightly ambiguous with regards to oil and water separation effectiveness; however, if the information

presented in the document is taken literally, it implied (on the basis of the Phase 1 and 2 ESIA assumption that 5% of water will be discharged if the injection systems are 95% available) that about 14.6 million barrels per year would be discharged.

It is clear, from the ACG ESIAs, that estimates of discharge volume were simply pro-rated on the basis of the only information available, which was the overall design availability of the water injection systems. The discharges predictions were not challenged during the ESIA approval process by the MENR, probably because they were not clearly described and may have been perceived as an emergency contingency, rather than as a predictable design-based event. Attention during the ESIA approval process focused to a much greater extent on the strategy for disposal of water separated onshore at the Sangachal Terminal.

As a follow-up the produced water disposal ESIA was modified (AIOC 2007) during the consultation process at the request of the Ministry of Ecology and Natural Resources, to include a statement that "no produced water would be discharged to the Caspian Sea". While this was understood by BP to apply only to water separated onshore, the amendment was made to the HSE Standards in Appendix II of the ESIA; these Standards were adopted from Phase 2, and could be interpreted as applicable to the entire ACG operations. The ACG ESIAs contained little relevant information on the potential produced water impact. This was largely because no data was available on the composition of Azeri produced water. In each ESIA, the impact was initially assessed as 'low' (largely on the basis that large-volume discharge was sanctioned in the North Sea) and was not therefore considered to merit further detailed assessment.

The ESIAs were only able to present information on the typical composition of North Sea produced water, and provided no useful estimate of potential Azeri produced water toxicity or impact. The general conclusion was that produced water would disperse and dilute rapidly to harmless levels. All above describes how complicated it is to fix errors, occurred

due to wrong predictions and lack of information available, in the approved ESIAs. Follow-up project implemented with the attempt to clarify and present new interpretation of the modelling and survey data to the regulator took a lot of time and effort. However it shows that in some cases EIA follow-ups are simply unavoidable, and the earlier it is done the better it is for the overall success of the project. Even in the absence of the formal ex-post evaluation procedure outlined in the ESISs and internal procedures, non-compliance cases and reaction from the regulatory authorities actually triggered follow-up and investigation of the problem. This resulted in development and negotiation of the separate ESIA for the produced water disposal, thus contributing to more careful consideration of the produced water issue in the following ESIAs. Role that EMS played in the case described above is very limited; however due to the open character of the system itself it was possible to raise problem to the highest level of the organisational structure and grasp proper attention of the management.

4.7.3 Commissioning and Start-up Operations

Emissions and discharges for the operations and construction phases are appropriately modelled and described in the ESISs for the ACG FFD Phases 1, 2 and 3. However description and analysis of the impacts and discharges occurring at the commissioning and start-up stages is not sufficiently covered. During the interviews one of the most common issues raised by the participants was lack of attention to the start-up and commissioning discharges (Safaraliyev, Mehdiyev pers. comm.). Volumes and composition of the chemicals that were discharged, duration of start-up flaring and other issues were challenged by the MENR at post-factum, when notification letters were submitted. With the first discharges occurred at the Central Azeri commissioning (Phase 1), they still were not included into the scope Phase 2 and 3 ESIAs. Main “problematic” issues not covered by the ESIAs are disposal of hydro test effluent offshore (although it is mentioned that it will be transported back ashore,

it is not practicable from the logistics point of view), well suspension fluids discharges, start-up flaring and produced water discharges. In most of the cases these issues were highlighted as having high probability of significant impact but were declared to be studied and discussed in future ESIAs, which was not always implemented though.

Section 5.5.7 of the Phase 3 ESIS with regards to the start-up and commissioning impact states: “Start-up of offshore production operations will be controlled under increasing loads and hydrocarbon throughput. The oil processing equipment will be started-up before the gas processing equipment and hence, while the latter comes on stream, it is anticipated that there will be an initial requirement to flare gas. In addition, early commissioning and start-up problems may also occur resulting in the requirement for additional flaring events. It is predicted that plant availability during the first year of operation will be 75%, and 85% in the second year. Thereafter offshore availability is assumed to be 95%”. This only statement does not clearly specify any commitments or provide plan for discharge and flaring of the significant amounts of effluents and produced gas.

The problem of inadequate coverage of these major environmental problems in the ESIAs seems to lay in miscommunication of the consultancy company preparing ESIA with the engineering team working on the project design (Mehdiyev pers. comm.). Absence of the formal follow-up resulted in another case which was mentioned several times during discussions with the Site Environmental Advisors, i.e. drilling discharges and interface with the MENR on the subject of well suspension fluids discharges. In this case, role of the Environmental Management System established in the company is to keep all the events not covered by the ESIA under control and make them visible to the management. EMS acts as a control tool to stay within the legal compliance, and to provide timely feedback on flaws in the system to the responsible parties. However if the mechanism of communication with the

teams involved in future EIAs delivery is not established the entire system proves to be inefficient.

5.0 DISCUSSION

Data collected during the documentation review and the interview sessions has proved that in absence of formal EIA follow-up process, properly designed and implemented Environmental Management System provides a reasonable substitution for it. Solution for the problem lies in the structure of the EMS, i.e. in the continual improvement spiral. There are three key areas of the Environmental Management System which are responsible for the EIA follow-up: monitoring, communication and knowledge management. In absence of formally imbedded EIA follow-up mechanism mentioned parts of the system provide necessary impulse for the overall improvement of the system. Examples of treated sewage discharge non-compliances, produced water discharges and start-up flaring displayed how important is to act immediately to introduce changes into the design of each following project to avoid transition of the same problem from one phase of the complex project to another. Detailed analysis of the collected information is presented below.

5.1 Key findings of the research

Even though there is no legal requirement for the EIA follow-up to be undertaken, and consideration for the EIA follow-up is not included into the texts of the final Environmental Impacts Statements reviewed, all personnel interviewed named lack of follow-up as a main problem of EIA system in the Company. Specific findings are presented below:

- *EIA follow-up process*. There were no processes of formal EIA follow-up in place before recent (2008) assignment of ESIA Coordination Team which is responsible now for collection of information from the operations and projects teams, and ensure that all post-project recommendations and findings are taken into account in course of preparation of future ESIAs. Process is now well established and does not fall under the EMS;

- *Operations feedback to the Projects.* Main issue raised by the Environmental Advisors from the operations was that problematic areas identified already on the earliest stage of implementation of Phase 1 project were not taken into account in Phase 2 and 3 ESIAs, although all information was timely communicated to the projects team. These resulted in the long chain of similar non-compliance events going through all phases of the project;
- *Monitoring and response.* System of early warnings incorporated into the organizations EMS structure worked well, however signals generated by the system were not properly actioned by the responsible parties. Compliance monitoring tools from the EMS acted as EIA follow-up substitute yet since there were certain flaws identified on the further levels, i.e. management review and corrective actions implementation, overall result was unsatisfactory;
- *Communication.* System of communication between different parts of the organization is very complicated and does not always meet its objectives. This is the case not only in communication link between projects and operations, but also between different parts of the operations, and between different managerial levels of the organizational structure;
- *Regulatory framework.* EIA follow-up is not mentioned in the national environmental legislation, therefore regulatory authorities do not have formal tools to influence the process and to ensure improvement of the entire EIA system in Azerbaijan;

5.2 Continual improvement philosophy of the EMS and EIA follow-up

One of the first and most important findings identified during the documentation review and confirmed during interviews, was lack of bridging document or procedure between Projects ESMS and Operations EMS. This created a considerable obstacle for the EMS to act

as a formal tool for the EIA follow-up within the organization. The issue is pressing first of all because of similarity of the projects. The fact that same significant mistakes and omissions are made in successive typical project designs talks for itself. The issue of no involvement of experts from operations is the second named by all interviewees. This again brings us to the problem of missing link.

However ESIA is the main source document which is consulted while establishing EMS in the organization. Aspects and impacts registers are being compiled on the basis of the aspects registers provided in the ESIS through consultation with the operations personnel. Monitoring plans are also being designed to cover compliance requirements outlined in the statements. Should management take the responsibility to conduct EIA follow-up it could be incorporated into the annually updated organizations environmental objectives and targets. And from that point it would be a formalized process with planning, implementation and management review.

Monitoring programs and compliance commitments tracking tools are the instruments to identify and to warn about the problems in the system. In turn, follow-up program should be able to investigate the root causes of the problem and to ensure that it is prevented from happening in the future developments. Only actual emissions and discharges data as well as information on other interactions with the natural environment, which becomes available only with commencement of the operations phase is appropriate to be compared against the predictions included to the ESIA to verify its accuracy. The same with mitigation measures: it is only practicable to assess their effectiveness at the operations phase. Mitigation measures outlined in the ESIA and included into the project design fall under the operational control procedures of the EMS, and therefore are being anyway continuously checked for conformance with the standard (in case if EMS is certified) and legal requirements.

Arguments above once more emphasize that properly designed and maintained environmental management system is capable to address EIA follow-up on its own. Structurally approach will be different from that which is followed when follow-up process is described in the EIS and is a part of legislative commitments. However, even in this case EMS will be a powerful tool to evaluate EIA itself and areas for its improvement.

5.3 Follow-up "between" Projects and Operations

Issue that was pointed out by all interviewees and which became evident from the case studies is the lack of communication between projects and operations. Although majority of the issues were well known before Phase 3 design was completed many mistakes were repeated again. Deepwater Gunashli platform (Phase 3) has same sewage treatment units and same issues with produced water discharges that were first observed on the Central Azeri (Phase 1).

Roots of the issue lay in the unclear distribution of roles and responsibilities for follow-up and monitoring not only between operations and projects teams but also between different teams within the projects camp, i.e. design, construction and commissioning. After the facility or the process is commissioned and responsibility for it is handed over to the operations team all costs for redesign and upgrade are to be covered from the operations budgets, that is why often it is decided that problem with, for example, off-spec sewage effluent discharges could be fixed with soft procedural or maintenance measures. Therefore findings and requests to introduce changes into the typical design are not always communicated to the projects and engineering teams.

One of the causes of this problem is that most of the work was implemented by the consultants, and they did not know to whom to talk to in operations. From my perspective another issue that was not brought to the attention is lack of BP management on what is being

done in terms of assessment by the contracted consultancies. Issues of poor EIA structuring also noticed by several interviewees might become possible due to the fact of the poor supervision of the consultants work. All 3 ESIAs were done by one Contractor Company. However it must be noted that significant progress was achieved with regards to the COP ESIA which is under development at the moment. ESIA Coordination Team is implementing "lessons learned" sessions with operations and maintenance groups, meetings with external consultants and public hearings.

The fact that produced water discharge volumes were significantly overestimated, whereas start-up and commissioning flaring was not properly covered indicates that these predictions were not grounded in the initial scientific research which should have been carried out at the ESIA development stage. Establishment of the ESIA Coordination Team responsible specifically for the collection of operational lessons learned and ensuring that all steps of the ESIA process are strictly followed is a positive step towards structuring of the Projects-Operations interface. This is a link that was missing for a long time; however, it is not clear yet how it fits into the existing structure of EMS.

Monitoring and correct interpretation of the monitoring data remains a key challenge during the EIA follow-up and the post-project evaluation. In certain cases actual data is so different from the predicted values that it becomes necessary to amend criteria set in the approved ESIAs through communication and discussion of new discharge and emissions targets with the regulatory authorities. Post project monitoring being or not a part of the EIA follow-up exercise is a tool to identify actual impacts of the development activities on the environment; operational monitoring should be a tool to determine root causes of the actual changes occurred in the environment. Monitoring plans and requirements were not explicitly set in the studied ESIAs, yet are well established through the organizations' EMS.

Internal and external environmental audits are very important sources of the indication of the problems in the system. Outcomes and recommendations of the EMS audits should provide good basis for the evaluation of the impacts on the environment and efficiency of the mitigation measures that are used by the organization. Soft procedural measures could be easily amended on the operations stage whereas changes that should be incorporated into the project design should be communicated to the projects team and EIA developers.

5.4 EIA legislation in Azerbaijan – the way forward

We can not really criticize national legislation for not being able to address issue of EIA follow-up in the studied cases, because EIA carried out for BP projects are to be done in accordance with the best international standards as it is stated in the PSA. Issues that were raised by the respondents and noted during the evaluation of the environmental legislative framework are still valid for the EIA system in Azerbaijan:

- Inconsistency of the local EIA legislation with the international practices;
- Lack of relevant expertise of dealing with EIA documents on the regulatory level;
- Although public consultations are mentioned in the Environmental Protection Law, public opinion has only consultative force and public concerns are not mandatory for reflection in the EIA;
- EIA legislation is being applied very selectively: only to the major projects and those done by the international companies;
- There is no working mechanism of enforcement of the current EIA regulations. Compliance audits and inspections carried out by the MENR or other regulatory officials are not regular;
- Legislation base should be amended to reflect specificity of the Caspian Sea;

EIA system which will be adopted in Azerbaijan should be flexible and should incorporate internal feedback mechanism for monitoring and evaluation of the legislative system itself, in order to be always fit for the purpose and be in line with the recent international developments in the field. In this respect involvement of international financial institutions and multinational companies for experience sharing is very important.

6.0 RECOMMENDATIONS

Following the analysis of the data obtained and evaluation of the Environmental Management System as well as present situation with the EIA follow-up in BP AzSPU, set of recommendations was compiled:

- Enhance and expand role of the ESIA Coordination Team to cover all aspects of the EIA follow-up, including incorporation of the current EMS based system of project ex-post evaluation, in order to achieve continual development of the ESIA practices in the organization;
- Document management procedures regarding EIA follow-up and project ex-post evaluation to ensure consistency in approach to the mentioned issue by all process participants;
- Improve communication link between operations and projects teams ensuring that all lessons learned on the operations phase are passed to the projects teams and are actioned upon to avoid repetition of similar drawbacks;
- Proper consideration should be given to participation of all stakeholders (i.e. environmental regulators, academia, NGOs, public concerned, financial institutions etc.) in the EIA follow-up process;
- Involve consultant company that is actually implementing EIA, to participate in lessons learned sessions with the operations teams, to ensure that problematic areas are well understood and the operational experience is taken into account;
- Consider evaluation of the monitoring and auditing system which is currently being used within the company to ensure that objectives of the EIA follow-up are covered;
- Re-assess need for the management involvement on different levels of the EMS process to provide EIA follow-up with the necessary support and resources;

- Consideration of EIA follow-up should be included into the scope of EIA development at the earliest stage possible.

These recommendations as well as results of the system analysis were presented to the management of BP AzSPU for the further consideration.

7.0 CONCLUSION

EIA follow-up could and should be an integral part of the organizations' EMS. Consideration of monitoring and evaluation of the impacts on the environment carried out as an integral part of the environmental management system is a basis for the follow-up process. Operational monitoring data as well as outcomes of the system audits could be compared against the predictions made in the EIAs to verify accuracy, and relevance of the mitigation measures declared in the EIS and project design. Early warning indicators incorporated into the structure of properly designed EMS should be capable to predict undesirable effects on the environment even in case if those impacts were not assessed during the EIA process.

Case studies displayed how important is to ensure that learning from the operations is immediately transferred to the projects phase. Properly implemented practice of EIA follow-up should be able to save money, time and in many cases prevent avoidable damage to the environment. Knowledge management is a very important aspect of both EIA follow-up exercise on its own and EMS in general. In this respect it should be mentioned that thorough analysis of the EIA follow-up results could display problems rooted in the operational practices and design, which could be very useful, indicating issues that are not related directly to the environmental performance. EMS monitoring tools could be easily modified to serve as data collection tool for EIA follow-up to avoid doubling cost and effort.

Unfortunately the legislative basis for the EIA process in whole and for the EIA bit is not developed in Azerbaijan. Internationally accepted practice is adopted only in form of non-binding guidelines which are followed only by the international companies. Enhancement of the regulatory instruments for the EIA is among most pressing issues for the environmental protection legislation in Azerbaijan. However absence of legally binding procedures should not stop individual developers from the implementation of the processes that are not only helping to keep the environment safe but also provide necessary support for the company

operations in terms of continuous improvement of the management system and efficiency of the design. EIA follow-up is the case where environmental consciousness helps to catch and avoid problematic areas in future by simple means.

EIA follow-up is particularly important when company operates similar facilities and works on typical projects in different locations. With the certain consideration given to the difference in local peculiarities, general findings and learning among all project and facilities remain very similar. This was evident in the studied cases of sewage treatment effluents discharges and produced water discharges, lessons from which were subsequently communicated to the company divisions in North Sea and in Gulf of Mexico. Combination of EIA follow-up and properly designed EMS helps not only to optimise organisations' environmental and legal commitments, but also to improve engineering design and avoid problems with maintenance which might not be directly linked to the environmental performance of the organisation.

So the overall conclusion is that inclusion of EIA follow-up scope into the structure of the EMS with the careful distribution of its role between different elements of the EMS would contribute to the overall efficiency of the EIA follow-up and would support future development of this tool. Having established EMS process in place it is always necessary to adhere to the basic philosophy of continual improvement which also lies in the basis of EIA follow-up. In addition, application of the EMS monitoring tools is the easiest and the most efficient way for comparison of what was stated in the EIS and what has happen in reality. Both environmental management tools would certainly benefit from this symbiosis.

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