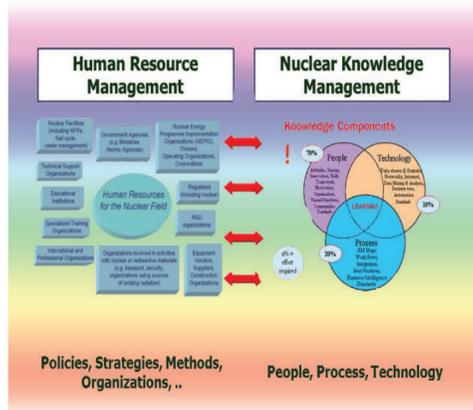
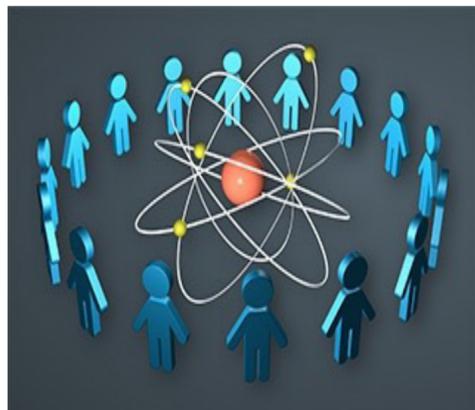


(The Ghana Nuclear Power Programme Organization (GNPPO) is mandated with the task of coordinating, overseeing and administering the phase-to-phase implementation of the Nuclear Power Programme in Ghana until the commissioning of Ghana's first nuclear power plant.)

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# GNPPO NEWSLETTER



## Management

### BACKGROUND

Ghana is making efforts to become a high-income country and an energy hub in the West African sub-region. A major driver to this ambition is the availability of efficient, affordable, reliable and environmentally friendly energy. The country is therefore taking systematic steps to include nuclear energy in its energy mix because nuclear technology promises to yield such type of energy.

An important step towards the inclusion of nuclear energy is that the country has developed a roadmap that follows the International Atomic Energy Agency's (IAEA) three-Phase model for the development of a nuclear power programme. There are 19 infrastructural issues that must be addressed (see GNPPO Newsletter June, 2016, edition, Vol. 1. No. 001). In each Phase, aspects of these issues must be tackled satisfactorily. Management is one of the infrastructural issues. This edition of GNPPO newsletter focuses on Management Systems which are models employed to manage complex projects like the nuclear power programmes and projects. Leadership and safety which constitute essential components of the management system will also be highlighted.

Efficient management is the bedrock for a successful execution of any project. In the nuclear industry, human and environmental safety is the utmost priority. Sound management, leadership and strong safety culture are needed to prevent and deal with any threat on safety. The management system provides the framework for the effective management of a nuclear power programme by ensuring that the available resources are well organised and applied efficiently to achieve the best outcome.

Roles and responsibilities of management of the Ghana nuclear power programme will change as the process progresses from study to implementation to operation and decommissioning. Highly competent managers are therefore vital to the success of the Ghana nuclear power programme at all stages. The goal of the GNPPO as a management body of Ghana nuclear power programme is to ensure an effective management that entails commitment to leadership and management systems, project management, strategy and planning, organisation and competence development.

### WHAT IS MANAGEMENT SYSTEM?

Management system has several definitions depending on the situation in which it is applied.

*In nuclear industries, management system refers to a set of interrelated or interacting processes for establishing policies and objectives of an organisation and enabling the objectives to be achieved in an efficient and effective way.*

A process is the building block of the management system. For instance, steps to be taken to achieve the overall aim of the GNPPO can be summarised into a process as illustrated in Figure 1.

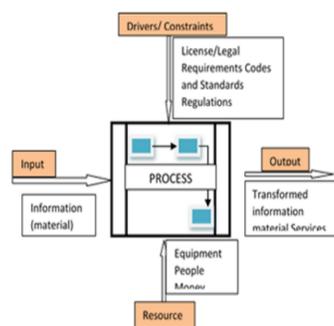


Figure 1 An illustration of a process

In this process, GNPPO takes in inputs which are the 19 infrastructural issues including management system to transform it into an output which is commissioning of the nuclear power plant for electricity generation onto the national grid using appropriate drivers/constraints. To achieve this, the process requires resources such as equipment, funding/finance, people (GNPPO advisory and technical bodies) etc.

### WHAT IS THE IMPORTANCE OF THE MANAGEMENT SYSTEM?

The fundamental safety objective in the planning, construction and operation of a nuclear power plant is the protection of people and the environment from harmful effects of ionising radiation. To achieve this objectives, there are various IAEA publications which establish the requirements for the management system to be developed and used in fostering leadership and management for safety. GNPPO makes use of these publications for example the Safety Fundamentals (SF-1) standard that establishes the fundamental safety objectives and related safety principles and concepts ([http://www-pub.iaea.org/MTCD/publications/PDF/Pub1273\\_web.pdf](http://www-pub.iaea.org/MTCD/publications/PDF/Pub1273_web.pdf)). SF-1 safety principle 3 is specific on leadership and management for safety.

*It states that Effective leadership and management for safety must be established and sustained in organisations concerned with facilities and activities that give rise to radiation risks.*

IAEA General Safety Requirements Part 3 (GSR-3) defines the requirements for establishing, implementing, assessing and continually improving a management system that can be used to foster

leadership and management for safety.

Additionally, an effective management system is important to the GNPPO in order aspects including:

- Improve safety and foster a stronger safety culture.
- Ensure clear goals, policies, strategies, objectives and organisational alignment for the programme development
- Define responsibilities clearly and assign roles to enhance clear leadership.
- Establish effective communication and coordination to promote continual improvement among all stakeholders.

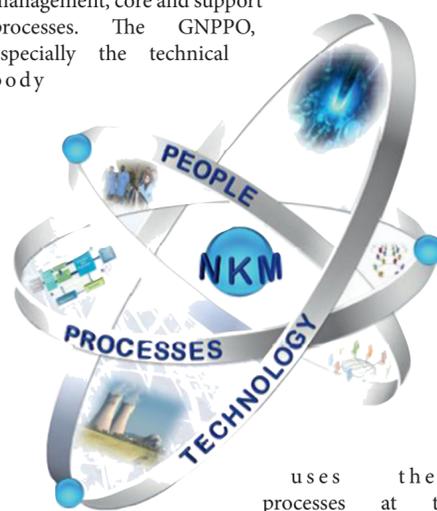
An effective management system leads to increased effectiveness and motivation thereby improving overall efficiency. Time and money can be saved without jeopardizing safety. It is a regulatory requirement to have a management system that demonstrates best practice and ensures compliance.

Another critical aspect of the management system is the provision of knowledge management that will ensure that knowledge gained by the GNPPO during this programme preparatory and development Phase (1) is transferred to the regulatory body and future owner/operator.

### WHAT IS THE STATUS OF THE MANAGEMENT SYSTEM FOR THE GNPPO AT ITS PRESENT PHASE?

GNPPO is presently at almost the end of Phase G1 of the nuclear power programme. The key processes at this Phase are project management, recruitment and training, document control (i.e., archiving, distribution, version control, security classification etc.), interfaces, knowledge management, document review, approval, and authorisation, and communication (i.e., stakeholder, press and public), quotation and outsourcing.

Currently, a management system map which is based on the Standard Nuclear Performance Model is being developed. This model is centred on three types of processes. These are the management, core and support processes. The GNPPO, especially the technical body



uses these processes at the Phase 1 of the nuclear power programme and will certainly use them also in the subsequent Phases. Some of these processes include safety and environmental assessment, human resource development, stakeholder engagement, management system development, data management development, etc. It is important to understand that the process will change as the programme progresses through the various Phases.

### HOW IS THE GNPPO STRENGTHENING ITS LEADERSHIP AND SAFETY CULTURE?

Leadership can be defined as the use of an individual's capabilities and competencies to give directions to and to influence the commitment of others. In a nuclear programme where safety is a priority, leadership for safety has to be demonstrated at the highest level. This will significantly influence organisational climate and be impactful on the outcome of the GNPPO activities in terms of culture for safety, safeguard, security and quality. It is hoped that effort will be made to pursue leadership development programmes that are suitable for GNPPO.

On Safety culture, it is the assembly of characteristics and attitudes in organisations and individuals which establishes that, as an overriding priority, protection and safety issues receive the attention warranted by their significance. Safety culture typifies safety as a clearly recognised value which is learning driven, accountable and can be integrated in all activities and enhanced through good leadership. GNPPO as an organisation is beginning to mould a culture that drives behaviour in such a way that it can bear positive influence on performance in safety, security, safeguards, quality, etc. GNPPO is making effort to strengthen its safety culture through workshops, fellowships, effective leadership and efficient management. It has been shown that generally about 70 % of all events are due to human errors and of this 80 % is due to individual errors. In the SF-1 principle 3 it is also stated that a safety culture that governs the attitudes and behaviour in relation to safety of all organisations and individuals concerned with nuclear programme must be integrated in the management system.

In effect, the GNPPO is fostering sound management, effective leadership and a strong safety culture which are needed for the efficient and timely execution of nuclear programme.



Figure 2 Implementation of a process-based Management System

### UPCOMING EVENTS

#### INTEGRATED NUCLEAR INFRASTRUCTURE REVIEW (INIR) MISSION

- INIR Mission will enable international expert's review the status of progress of work on nuclear power infrastructure development in Ghana.
- Date: 16 -21 January, 2017
- Venue: Mensvic Hotel

#### NEXT EDITION OF GNPPO NEWSLETTER

In the next edition of the GNPPO Newsletter, details of the INIR Mission would be reported.