IAEA Nuclear Energy Series

No. NG-G-5.1

Stakeholder Engagement in Nuclear Programmes

IAEA
International Atomic Energy Agency

IAEA NUCLEAR ENERGY SERIES PUBLICATIONS

STRUCTURE OF THE IAEA NUCLEAR ENERGY SERIES

Under the terms of Articles III.A.3 and VIII.C of its Statute, the IAEA is authorized to "foster the exchange of scientific and technical information on the peaceful uses of atomic energy". The publications in the **IAEA Nuclear Energy Series** present good practices and advances in technology, as well as practical examples and experience in the areas of nuclear reactors, the nuclear fuel cycle, radioactive waste management and decommissioning, and on general issues relevant to nuclear energy. The **IAEA Nuclear Energy Series** is structured into four levels:

(1) The **Nuclear Energy Basic Principles** publication describes the rationale and vision for the peaceful uses of nuclear energy.
(2) **Nuclear Energy Series Objectives** publications describe what needs to be considered and the specific goals to be achieved in the subject areas at different stages of implementation.
(3) **Nuclear Energy Series Guides and Methodologies** provide high level guidance or methods on how to achieve the objectives related to the various topics and areas involving the peaceful uses of nuclear energy.
(4) **Nuclear Energy Series Technical Reports** provide additional, more detailed information on activities relating to topics explored in the **IAEA Nuclear Energy Series**.

The IAEA Nuclear Energy Series publications are coded as follows: **NG** – nuclear energy general; **NR** – nuclear reactors (formerly **NP –** nuclear power); **NF** – nuclear fuel cycle; **NW** – radioactive waste management and decommissioning. In addition, the publications are available in English on the IAEA web site:

www.iaea.org/publications

For further information, please contact the IAEA at Vienna International Centre, PO Box 100, 1400 Vienna, Austria.

All users of the IAEA Nuclear Energy Series publications are invited to inform the IAEA of their experience for the purpose of ensuring that they continue to meet user needs. Information may be provided via the IAEA web site, by post, or by email to Official.Mail@iaea.org.

STAKEHOLDER ENGAGEMENT IN NUCLEAR PROGRAMMES

The following States are Members of the International Atomic Energy Agency:

AFGHANISTAN
ALBANIA
ALGERIA
ANGOLA
ANTIGUA AND BARBUDA
ARGENTINA
ARMENIA
AUSTRALIA
AUSTRIA
AZERBAIJAN
BAHAMAS
BAHRAIN
BANGLADESH
BARBADOS
BELARUS
BELGIUM
BELIZE
BENIN
BOLIVIA, PLURINATIONAL STATE OF
BOSNIA AND HERZEGOVINA
BOTSWANA
BRAZIL
BRUNEI DARUSSALAM
BULGARIA
BURKINA FASO
BURUNDI
CAMBODIA
CAMEROON
CANADA
CENTRAL AFRICAN REPUBLIC
CHAD
CHILE
CHINA
COLOMBIA
COMOROS
CONGO
COSTA RICA
CÔTE D'IVOIRE
CROATIA
CUBA
CYPRUS
CZECH REPUBLIC
DEMOCRATIC REPUBLIC OF THE CONGO
DENMARK
DJIBOUTI
DOMINICA
DOMINICAN REPUBLIC
ECUADOR
EGYPT
EL SALVADOR
ERITREA
ESTONIA
ESWATINI
ETHIOPIA
FIJI
FINLAND
FRANCE
GABON
GEORGIA
GERMANY
GHANA
GREECE
GRENADA
GUATEMALA
GUYANA
HAITI
HOLY SEE
HONDURAS
HUNGARY
ICELAND
INDIA
INDONESIA
IRAN, ISLAMIC REPUBLIC OF
IRAQ
IRELAND
ISRAEL
ITALY
JAMAICA
JAPAN
JORDAN
KAZAKHSTAN
KENYA
KOREA, REPUBLIC OF
KUWAIT
KYRGYZSTAN
LAO PEOPLE'S DEMOCRATIC REPUBLIC
LATVIA
LEBANON
LESOTHO
LIBERIA
LIBYA
LIECHTENSTEIN
LITHUANIA
LUXEMBOURG
MADAGASCAR
MALAWI
MALAYSIA
MALI
MALTA
MARSHALL ISLANDS
MAURITANIA
MAURITIUS
MEXICO
MONACO
MONGOLIA
MONTENEGRO
MOROCCO
MOZAMBIQUE
MYANMAR
NAMIBIA
NEPAL
NETHERLANDS
NEW ZEALAND
NICARAGUA
NIGER
NIGERIA
NORTH MACEDONIA
NORWAY
OMAN
PAKISTAN
PALAU
PANAMA
PAPUA NEW GUINEA
PARAGUAY
PERU
PHILIPPINES
POLAND
PORTUGAL
QATAR
REPUBLIC OF MOLDOVA
ROMANIA
RUSSIAN FEDERATION
RWANDA
SAINT LUCIA
SAINT VINCENT AND THE GRENADINES
SAMOA
SAN MARINO
SAUDI ARABIA
SENEGAL
SERBIA
SEYCHELLES
SIERRA LEONE
SINGAPORE
SLOVAKIA
SLOVENIA
SOUTH AFRICA
SPAIN
SRI LANKA
SUDAN
SWEDEN
SWITZERLAND
SYRIAN ARAB REPUBLIC
TAJIKISTAN
THAILAND
TOGO
TRINIDAD AND TOBAGO
TUNISIA
TURKEY
TURKMENISTAN
UGANDA
UKRAINE
UNITED ARAB EMIRATES
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND
UNITED REPUBLIC OF TANZANIA
UNITED STATES OF AMERICA
URUGUAY
UZBEKISTAN
VANUATU
VENEZUELA, BOLIVARIAN REPUBLIC OF
VIET NAM
YEMEN
ZAMBIA
ZIMBABWE

The Agency's Statute was approved on 23 October 1956 by the Conference on the Statute of the IAEA held at United Nations Headquarters, New York; it entered into force on 29 July 1957. The Headquarters of the Agency are situated in Vienna. Its principal objective is "to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world".

IAEA NUCLEAR ENERGY SERIES No. NG-G-5.1

STAKEHOLDER ENGAGEMENT IN NUCLEAR PROGRAMMES

INTERNATIONAL ATOMIC ENERGY AGENCY
VIENNA, 2021

COPYRIGHT NOTICE

Marketing and Sales Unit, Publishing Section
International Atomic Energy Agency
Vienna International Centre
PO Box 100
1400 Vienna, Austria
fax: +43 1 26007 22529
tel.: +43 1 2600 22417
email: sales.publications@iaea.org
www.iaea.org/publications

Printed by the IAEA in Austria
December 2021
STI/PUB/1967

IAEA Library Cataloguing in Publication Data

Names: International Atomic Energy Agency.
Title: Stakeholder engagement in nuclear programmes / International Atomic Energy Agency.
Description: Vienna : International Atomic Energy Agency, 2021. | Series: IAEA nuclear energy series, ISSN 1995–7807 ; no. NG-G-5.1 | Includes bibliographical references.
Identifiers: IAEAL 21-01465 | ISBN 978–92-0–133721–4 (paperback : alk. paper) | ISBN 978–92–0–133421–3 (pdf) | ISBN 978–92-0–133521–0 (epub)
Subjects: LCSH: Nuclear facilities — Management. | Stakeholder management. | Nuclear power plants — Planning. | Nuclear industry — Decision making.
Classification: UDC 621.039:005.331 | STI/PUB/1967

FOREWORD

The IAEA's statutory role is to "seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world". Among other functions, the IAEA is authorized to "foster the exchange of scientific and technical information on peaceful uses of atomic energy". One way this is achieved is through a range of technical publications including the IAEA Nuclear Energy Series.

The IAEA Nuclear Energy Series comprises publications designed to further the use of nuclear technologies in support of sustainable development, to advance nuclear science and technology, catalyse innovation and build capacity to support the existing and expanded use of nuclear power and nuclear science applications. The publications include information covering all policy, technological and management aspects of the definition and implementation of activities involving the peaceful use of nuclear technology.

The IAEA safety standards establish fundamental principles, requirements and recommendations to ensure nuclear safety and serve as a global reference for protecting people and the environment from harmful effects of ionizing radiation.

When IAEA Nuclear Energy Series publications address safety, it is ensured that the IAEA safety standards are referred to as the current boundary conditions for the application of nuclear technology.

Engaging with stakeholders is an essential part of any complete nuclear programme. Involving stakeholders in decision making processes, even those stakeholder groups that do not have a direct role in making those decisions, can enhance public confidence in the application of nuclear science and technology and strengthen communication among the key organizations in a nuclear programme.

This publication shows the importance of stakeholder engagement throughout the life cycle of all nuclear facilities, including operating and new reactors, all aspects of the nuclear fuel cycle from uranium mining to spent fuel and radioactive waste management, decommissioning and non-power applications. In 2011, the IAEA published IAEA Nuclear Energy Series No. NG-T-1.4, Stakeholder Involvement throughout the Life Cycle of Nuclear Facilities as a Technical Report. In 2019, the structure of the Nuclear Energy Series was revised and a standalone topic for stakeholder engagement was introduced. This publication therefore builds on the existing publications on stakeholder engagement and presents information at the Nuclear Energy Series Guide level.

This publication follows what is required in IAEA Safety Standards Series Nos GSR Part 1 (Rev. 1), Governmental, Legal and Regulatory Framework for Safety, and GSR Part 2, Leadership and Management for Safety, for ensuring that

appropriate interaction with interested parties takes place, including by identifying such interested parties and by defining an appropriate strategy for interacting with them, with resulting processes and plans. Furthermore, GSR Part 2 also requires that senior management advocate and support "an organizational culture that supports and encourages trust, collaboration, consultation and communication".

This publication presents general guidance and is intended to assist senior management and experts responsible for stakeholder engagement and public communication at the key organizations involved in a nuclear project or facility, including government, the regulatory body and the licensee.

The IAEA wishes to acknowledge the assistance of the external experts listed at the end of this publication, in particular K. Barfield (United States of America). The IAEA officer responsible for this publication was L. Berthelot of the Division of Nuclear Power.

EDITORIAL NOTE

CONTENTS

1. INTRODUCTION

1.1. BACKGROUND

As societies evolve and citizens have increasingly easy access to more information, stakeholder engagement has become recognized as a growing area of strategic value for the development of nuclear programmes.

Nuclear science and technology often face unique challenges with regard to public understanding and acceptance. It is generally recognized that nuclear technologies contribute significantly to society through the generation of reliable, low-carbon electrical energy and in medical and industrial applications. However, some stakeholder groups view these benefits as being outweighed by issues including long term liabilities associated with radioactive waste, construction costs, or by an association with nuclear weapons. Additionally, concern over potential health effects of radiation often leads to public perception of risks that are much greater than the actual risks that experts attribute to nuclear technologies. This fear is exacerbated by the invisible nature of radiation. Coupled with this is the fact that pursuing a nuclear programme can be a long term political and economic commitment, highly technological and heavily dependent on scientific knowledge [1]. These characteristics can create obstacles to public understanding and support, which are crucial elements for the success of nuclear programmes. It is important to remember that whether or not a perception seems justified, it is real and needs to be addressed as such.

Historically, it was thought that nuclear projects were too complicated for the average citizen to understand [2]. Organizations used the 'decide, announce, defend' approach (sometimes called DAD) to making decisions about projects in the nuclear field. With the decide, announce, defend approach, industry and government carry out early steps behind closed doors, with little consideration for public discussion. The result of the deliberations would then be announced and the public would be presented with a decision they are expected to buy into [3]. Simple, often bland, reassurances were all that were employed to alleviate fears regarding nuclear programmes and facilities.

As a result of the challenges in communicating nuclear projects and in the absence of information sharing, dialogue and consulting, the public will form their opinions, trusting various sources of information (either personal or media), which may not be supported by science, and making an assessment of the perceived risks and possible benefits of nuclear programmes. In such conditions public opinions may not be formed based on facts and may be under the influence of, for example, poor communication or groups with opposing views, thereby jeopardizing confidence building in the project.

It is important to note that stakeholder engagement is one of the 19 infrastructure issues[1] covered in the IAEA's Milestones approach, a structured methodology used by Member States for the development of infrastructure for a new or expanding nuclear power programme [4]. All 19 infrastructure issues play a key role in the development of a nuclear power programme. To increase the likelihood of success, a holistic and comprehensive approach is necessary.

Each organization with a responsibility in a nuclear programme — the government (in the case of a new programme through the nuclear energy programme implementing organization, or NEPIO, if it exists), the owner/operator, the regulator — has a role in carrying out effective stakeholder engagement activities throughout the life cycle of nuclear facilities. These organizations engage with each other while concentrating on their distinct stakeholder engagement concerns.

1.2. OBJECTIVE

As stakeholder engagement is a recognized strategic element throughout the entire lifespan of nuclear facilities, the objective of this publication is to highlight the key principles of stakeholder engagement and to provide a practical guide for developing and implementing stakeholder engagement programmes.

1.3. SCOPE

This publication provides theoretical and practical guidance on the development and implementation of stakeholder engagement programmes and activities. It also includes tools such as templates to help establish a stakeholder engagement programme and identify associated activities, including tools for stakeholder analysis (behaviours, motivation and values). As such, it provides basic guidance which can be further developed and adjusted to each specific type of facility, moment in its life cycle, and/or the group of stakeholders with which to engage.

---

[1] The 19 infrastructure issues of the IAEA Milestones approach are national position, nuclear safety, management, funding and financing, legal framework, safeguards, radiation protection, regulatory framework, electrical grid, human resources development, stakeholder involvement, site and supporting facilities, environmental protection, emergency planning, nuclear security, nuclear fuel cycle, radioactive waste management, industrial involvement and procurement.

This publication demonstrates the importance of stakeholder engagement throughout the life cycle of all nuclear facilities, including operating and new reactors, all aspects of the nuclear fuel cycle, from uranium mining to spent fuel and radioactive waste management, decommissioning, and non-power applications.

The publication does not provide:

— Information on stakeholder engagement in non-nuclear facility activities generating ionizing radiation, for example in the medical, industrial and agricultural fields;
— Specific details regarding stakeholder engagement for particular stages in the life cycle of nuclear facilities (Refs [5, 6]);
— Specific details regarding engagement for particular stakeholder groups (e.g. local stakeholders, policy and decision makers);
— Information on communicating with the public in a nuclear or radiological emergency (Ref. [7]);
— Wording for key messages, which are to be developed at national or organizational levels.

1.4. STRUCTURE

This publication consists of four main sections in addition to this introduction.

Section 2 provides an overview of stakeholder engagement including definitions for stakeholder and the significance and principles of stakeholder engagement.

Section 3 covers the development of a stakeholder engagement strategy and plan (Appendix I provides a template), including practical information on how to plan for stakeholder engagement and perform stakeholder identification and mapping (Appendix II provides additional information).

In Section 4, the roles and responsibilities of key organizations in nuclear programmes with regard to stakeholder engagement are presented, including the importance of their coordination, as well as the nuances between each organization and how this influences the type of stakeholder engagement approaches and activities selected.

Section 5 describes stakeholder engagement in the different life cycle stages, including an overview of all the stages of a nuclear facility and how each stage necessitates a different approach to stakeholder engagement planning and activities.

The appendices provide practical tools and templates to support the establishment of a comprehensive, rigorous and sustained long term stakeholder engagement programme.

1.5. USERS

This guide will assist communication experts, senior managers and other experts to establish and maintain a long term stakeholder engagement strategy and activities for a nuclear programme. These communication experts work for key organizations involved in the nuclear project or facility, including government, owner/operator and regulator. Communicators in other organizations or other employees who are involved in communication or engagement activities might also find the content of this guide useful and relevant to their work.

Because stakeholder engagement involves partnership and relationship building as well as communication, it cannot be carried out effectively without the full support and participation of senior management. The intended audience of this publication is therefore broader than communication experts and includes the leaders of organizations who are also expected to be active engagement players.

At the practitioner level, nuclear communication is a specialized field that benefits from trained communication experts, working closely with senior managers and in consultation with technical experts in nuclear science and technology as well as with experts in other fields such as economics, education, transportation, human resource development, environment and more.

2. OVERVIEW OF STAKEHOLDER ENGAGEMENT

Stakeholder engagement in nuclear programmes and throughout the life cycle of nuclear facilities is best achieved through an open dialogue between the government, the regulatory body, the owner/operator and other stakeholders, whether they be institutions or individuals. The key principles of stakeholder engagement are identified in this publication as: building trust, demonstrating accountability, exhibiting open and transparent communication, practising early and frequent consultation and communicating benefits and risks. Engaging stakeholders is about creating dialogue, including promoting the benefits of nuclear technology and explaining its risks or complexities, and taking into account the roles and inputs of all interested parties in the decision making process. Ultimately, stakeholder engagement is a genuine intention to understand

the concerns, perspectives and interests of stakeholders to foster collaborative work. It is more than words and needs to be reflected both in actions and empathetic dialogue.

Stakeholders include legislators, media, government agencies and decision makers, the owner/operator, the regulatory body, suppliers, workers, communities near actual or potential sites, neighbouring countries, non-governmental organizations, and the public. The most influential stakeholders and societal opinion leaders will vary across countries and could include national and local government officials, heads of business and industry and leaders of non-governmental organizations.

While openness and transparency are important, sustained, successful sociopolitical engagement will also depend on the competence and credibility of the organizations and individuals responsible for the nuclear programme. The competence of the regulatory body and the owner/operator is vital to maintaining public confidence. This is also crucial in case of external circumstances occurring elsewhere in the world but that could still influence stakeholder concerns.

2.1. DEFINITION OF A STAKEHOLDER

A broad definition of a stakeholder is any group or individual who feels affected by an activity, whether physically or emotionally.

There will be organizations and groups that are statutory stakeholders — those required by law to be involved in any planning, development or operation of a nuclear project — as well as non-statutory stakeholders — those who have an interest in or will be directly or indirectly impacted. The adequate inclusion or exclusion, for whatever reason, of any stakeholder group can contribute significantly to the success or failure of a nuclear project. Figure 1 illustrates a non-exhaustive list of stakeholders in a nuclear programme. In reality, many stakeholders will select themselves and organizations will need to engage with them as needed. Organizations will not be able to identify up front who all their stakeholders will be throughout a nuclear programme's life cycle. It is important to stay flexible and open-minded about who will need to be engaged, at what time and in what way.

2.2. IMPORTANCE OF STAKEHOLDER ENGAGEMENT

Effective stakeholder engagement is a crucial element of any complete nuclear programme. A well-defined national position is a prerequisite for a sustainable nuclear programme; yet, governmental support is strengthened

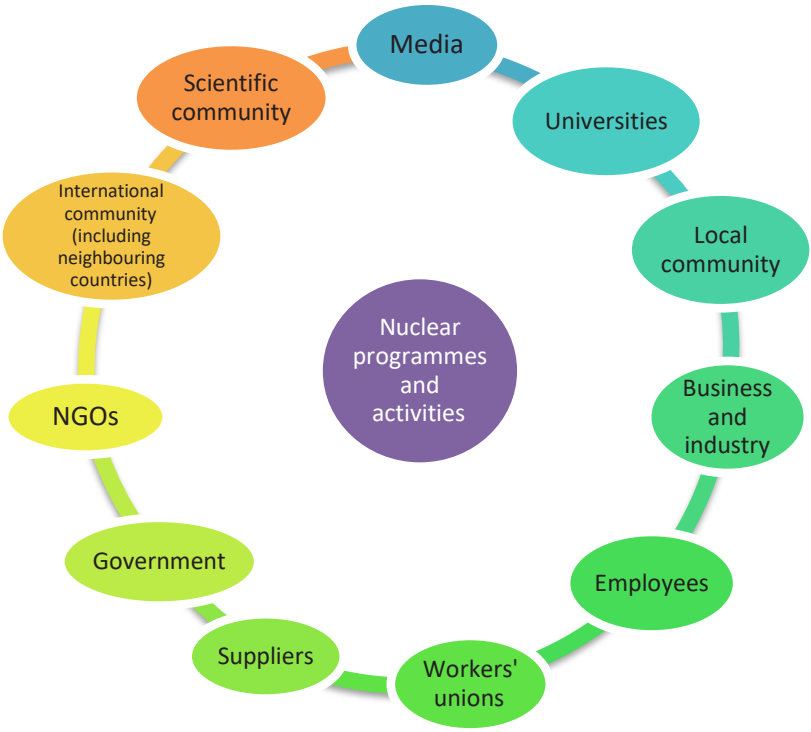


FIG. 1. Non-exhaustive list of stakeholders in a nuclear programme (see Appendix II for a stakeholder prioritization methodology).

through stakeholder confidence, as national governments typically do not press ahead with nuclear programmes in the face of significant public opposition. Government support can be strengthened by a positive and supportive political atmosphere, which includes appropriate stakeholder engagement.

Stakeholder engagement is not about simply following a standardized procedure that may have been suitable for another organization or situation, rather it needs to be flexible and varied according to different national laws, norms and cultures.

Organizations can use their stakeholder engagement programme as an important way of demonstrating their compliance with various requirements and regulations. It is important to recognize that the level of interaction varies with regard to the particular stakeholder group concerned, and that different methods and tools need to be used as appropriate.

One purpose of engagement is to foster a collaborative environment in which stakeholders can share their views, and in which these views are

considered. At the same time, it needs to be recognized that the aim of an effective stakeholder engagement programme is not necessarily to gain consensus, but rather for stakeholders to understand the basis for a decision and to have been involved, and thus have greater trust that the decision was appropriate as well as a greater trust in the decision maker.

Increased public participation in decisions can promote a greater degree of understanding of the issues and can help to develop appreciation of the actual risks and benefits of nuclear technologies, such as those found in nuclear energy, compared with the risks and benefits of other energy sources.

In most cases, the final responsibility for decision making lies with the respective authorities and is typically informed by various stakeholder inputs. However, public engagement in the overall process can be crucial in building relationships based on confidence and trust, without which progress can be difficult if not impossible. This involvement needs to take place throughout the development and implementation of a nuclear programme. It has to be regular and frequent, not only when there is a problem or concern, in order to engender trust and confidence among all stakeholders, including national and international communities.

2.3. KEY PRINCIPLES OF STAKEHOLDER ENGAGEMENT

The key principles described in this section represent values, behavioural and procedural qualities and expected outcomes that form the basis for conducting effective stakeholder engagement. When all engagement is founded on building trust, demonstrating accountability, exhibiting openness and transparency, practicing early and frequent consultation, and communicating benefits and risks, it supports reaching the strategic and organizational objectives of the key organizations (as described in Section 4) while showing due regard for the interests and concerns of stakeholders.

Collectively, the principles are considered good practice based on experience from the implementation and operation of a wide variety of nuclear projects. The principles are also interlinked: for example, being transparent about why certain security related information cannot be released can help build trust, while maintaining a level of ongoing consultation. Communicating about all topics of expressed interest, including topics that might not seem relevant but are of interest to stakeholders, will help to demonstrate a genuine interest in engaging in a comprehensive manner.

It is important to note that trust is both a principle as well as a fundamental outcome needed for effective stakeholder engagement. Not following these key

principles can have significant and negative impacts on a nuclear programme, including contributing to delays, financial losses and reputational damage.

2.3.1. Build trust

Trust enables individuals and organizations to work together more easily and effectively. Developing relationships results in increased trust. Earning trust and building relationships is the result of a strategic investment in effort and time: the results of this investment include increased confidence, less uncertainty and clearer decision making processes.

The organizations and institutions involved in a nuclear programme in particular need to emphasize earning the trust of the community (local or national). When an organization demonstrates through words, tone, actions and approaches that are reliable, responsible and fair, the trust of stakeholders in the decision making processes can increase.

Despite best efforts, trust can quickly be adversely affected by unexpected events such as unintended environmental impacts or system failures. Trust can be strengthened by demonstrating technical competence and adherence to high standards both in performance and reporting.

2.3.2. Demonstrate accountability

Accountability for fully exercising each organization's roles and responsibilities (see Section 4) requires that all parties communicate their activities clearly and concisely, which is an important contributor to building and maintaining trust. Accountability also includes an expectation of following up with clear feedback to those involved, explaining the process and why contributions may or may not have been taken on board in the final outcome. Responsible organizations need to ensure there are routes for reporting on final decisions, strategies or implementation plans to the public and other stakeholders.

2.3.3. Exhibit openness and transparency

For any country with or considering a nuclear programme, open communication with all stakeholders needs to address their respective interests in and concerns with the programme as completely and consistently as possible. Communicating facts about the technology as well as decision making related to programme implementation and evaluation remain important through all phases of the life cycle.

Access to information needs to be easy, shared by a wide variety of sources on multiple platforms and include government or regulatory decisions, research reports and other technical information.

2.3.4. Practise early and frequent consultation

Engaging with stakeholders from the beginning and frequently is essential in developing and implementing a nuclear programme. Inclusive stakeholder engagement contributes to building trust and, when adopted early, enables anyone interested in being part of the process to share their views. It also provides the basis to explain where to find information, and how to submit comments and questions, and to convey how all input is addressed.

Before engaging with stakeholders, understanding their opinions and concerns need to be a starting point (see Appendix III for guidance on opinion research). Consulting with stakeholders before decisions are made further supports the principle of openness and transparency. Having identified concerns and sensitivities among the various stakeholder groups, and how those groups may impact the programme in question, it is crucial to explain what decisions are required and how stakeholders can influence them — and if not, why not.

The complexity of nuclear programmes cannot be used as an excuse to withhold information, including in the early stages (the purpose, scope, risks and approach). Nevertheless, information related to security and safeguards is, by nature, necessary to withhold at times. A stakeholder's difficulty in comprehending an issue also cannot be assumed or be used as a reason for withholding open information. As the programme matures and new technologies or operational practices are introduced, ongoing communication will offer assurance to stakeholders that they have up-to-date information.

Different challenges will emerge at different times; maintaining visibility and credibility supports reaching solutions when issues arise.

2.3.5. Communicate benefits and risks

One important element in conducting open communication with all stakeholders is to address the issues of nuclear programme benefits, nationally and locally, as well as the risks, commitments and obligations. This responsible approach is essential to building and maintaining trust and confidence in a nuclear programme. Being open about the benefits as well as risks of a nuclear programme is also an effective way of dealing with opposing groups, because it allows the responsible organizations to frame messages and create understanding about common concerns such as radiation effects, waste management and more.

Failing to address these risks in a transparent manner leaves a communication void that groups with opposing views can fill with their messages.

It is also important to bear in mind how much risk perception influences opinion and how much that perception can be influenced by misinformation or rumours that are not addressed or corrected. Public opinion is often based on perception rather than on scientific data or facts, and simply introducing scientific messages will rarely eliminate the influence of risk perception on public opinion.

3. DEVELOPING STAKEHOLDER ENGAGEMENT

The development of a stakeholder engagement strategy and plan will support an organization's efforts to communicate and engage with all identified interested parties. A strategy lays out the direction the project will take, while a plan details how to carry out the strategy systematically and with clear procedures. While the strategy and plan may be contained in a single document, implementation plans may be updated with greater frequency than the stakeholder engagement strategy, often based on progress and development of the nuclear programme overall.

Developing a stakeholder engagement strategy (see Appendix I for a template) requires intensive and extensive research and planning, but the effort is worthwhile. Poorly strategized and/or implemented stakeholder engagement and communication may contribute to setbacks in a nuclear programme.

For governments and owner/operator organizations, building a coherent and compelling case for a nuclear programme requires not only a strong national position but also the acceptance that stakeholder engagement is an ongoing process and needs constant refinement. See Section 4 for responsibilities of particular organizations with regard to stakeholder engagement. Without a strong stakeholder engagement strategy and plan, there are times when organizations may find themselves reacting to opposing views and being defensive, instead of being proactive and building understanding of and support for nuclear technologies. Through stakeholder engagement, organizations and their stakeholders can work on compromise, sharing information and concerns to address issues before they negatively impact the programme. For the regulatory body, the same efforts in stakeholder engagement need to be followed, to ensure its independent role is understood and to disseminate the key messages relevant to its oversight activities.

Developing a strategy and plan provides a guiding framework for organizations to pursue their stakeholder engagement initiatives as well as their nuclear programme objectives by seeking out, listening to and acting upon

stakeholders' views. The following key steps can be taken to develop or refine a stakeholder engagement strategy and plan.

3.1. ESTABLISH A CORE COMMUNICATION TEAM

Before the process of building support for a nuclear programme begins, senior management demonstrates its commitment to stakeholder engagement as a priority by establishing a staff of communication experts responsible for the stakeholder engagement strategy and plan.

An effective approach is to establish coordination channels and share information between the communication experts in the key organizations (government, owner/operator and regulator). Such coordination supports organizations in delivering messages appropriate to their respective roles and responsibilities and facilitates timely communication with stakeholders. It also helps build and maintain strong interorganizational relationships.

An important initial consideration is also spokesperson identification and training. Spokespersons might be communication experts, senior leaders or technical staff, depending on the type of information being communicated and to whom. Public familiarity with officials and staff across an organization contributes to the development of stakeholder relationships that can be useful in later stages of the programme.

3.2. EVALUATE RESOURCES AND CREATE A BUDGET

Effective stakeholder engagement can be carried out within a range of budgets. Funds for stakeholder engagement have to be allocated as part of an organization's budget. Where there is a large budget, organizations can consider investing in communication channels and tools that will give greater exposure to their stakeholder engagement initiatives and they can rely on outside resources with specific skills needed to supplement their own staff. Nevertheless, in the event that an organization needs to stay fiscally lean in its communication efforts, it is still possible to identify and use affordable and efficient means to create an impactful stakeholder engagement programme. It is important to recognize what can and cannot be done, and to approach stakeholder engagement realistically before starting specific activities. Actions ought to be taken to:

— Review existing resources;
— Set a budget;
— Consider outside resources.

Stakeholder engagement needs to be an active component of an organization's overall nuclear programme and include appropriate leadership and resources. While outsourcing certain activities can be useful, it is important that ownership of stakeholder engagement remain the responsibility of the key organizations involved.

3.3. DEVELOP A STAKEHOLDER ENGAGEMENT STRATEGY AND PLAN

Once the communication team has been established, priorities set, resources evaluated and budget created, the drafting of a stakeholder engagement strategy and plans can commence. Each organization involved in a nuclear programme will develop its own stakeholder engagement strategy and plans. These can be discussed at an interorganizational level to strengthen coordination, message dissemination and, ultimately, safety and security. For a country introducing nuclear power, a single national stakeholder engagement strategy with its associated implementation plans is typically the starting point before the key nuclear programme organizations are established.

3.3.1. Identify lead organizational division

There is a need for each organization, as described in Section 4, to identify or clarify which internal division leads the development and implementation of the stakeholder engagement strategy and plan. This is usually the communication department, but some organizational structures might assign the responsibility differently. Clear ownership is important to ensuring that the stakeholder engagement strategies and plans are put into place.

3.3.2. Coordinate internal communication

Internal communication is a vital component of any stakeholder engagement programme. A programme can only be successful if staff members of the organization are inspired and committed to support communication of the programme's key messages. This is one aspect of "an organizational culture that supports and encourages trust, collaboration, consultation and communication" as required in GSR Part 2 [8]. Once the understanding and support of the internal team is secured, communication can then take place and be extended to the external stakeholders that an organization has identified. When working with international partners, members of their organizations may be treated as internal audiences for the purpose of communication.

3.3.3. Build a stakeholder engagement strategy

A stakeholder engagement strategy (see Appendix I) provides direction for stakeholder engagement by including the key elements of situation analysis, objectives, scope, key stakeholders, high level messages, timeline, resources, tools, methods and approaches, and evaluation, as discussed below.

3.3.3.1. Situation analysis

Conducting a situation analysis allows for a stronger understanding of the knowledge, opinions and interests of the public and other stakeholder groups regarding the nuclear programme.

To carry out a situation analysis in order to understand the interest and influence levels of stakeholder groups, recognize the strengths and weaknesses in current activities and identify any gaps in the stakeholder engagement planning process, the use of a wide range of tools is necessary, including public opinion polls and surveys (see Appendix III). However, public opinion can change quickly, sometimes swayed by seemingly minor events, and its monitoring is important. Data can also be gathered from a variety of sources including research, documents related to the project, and processes that encourage direct participation such as workshops, focus groups discussions, meetings and field visits. These activities might be targeted for different types of stakeholder groups, for example partners or community members.

Possible situation analysis approaches that can be applied to the development of a stakeholder engagement strategy include:

— Political, economic, social and technological analysis (sometimes called simply PEST) — considering how political, economic, social and technological factors could affect the success or failure of a nuclear programme. For example, a change of government would mean building contacts with new officials and understanding new policy agendas;
— Strengths, weaknesses, opportunities and threats analysis (usually referred to as SWOT) — assessing the strengths, weaknesses, opportunities and threats of a project, programme or organization can be a useful tool in evaluating the effectiveness of a current engagement programme as well as the reputation of an organization among stakeholders.

3.3.3.2. Objectives

A well-defined overarching goal is one that is neither too vague nor too broad and that can be clearly understood by all involved in implementing the

programme. Objectives need to then be developed as to how to achieve this goal. Specific, measurable, achievable, realistic, time-bound, evaluated and reviewed objectives (often abbreviated to SMARTER) will serve as one of the primary means for measuring results of the stakeholder engagement programme.

The objectives will vary depending on which organization is developing the programme (as described in Section 4) and for which stage of the nuclear life cycle (discussed in Section 5) the strategy and plans are being developed.

In the case of a new facility or a new nuclear programme, for example, one of the objectives of an owner/operator might be public acceptance of the site selection or understanding of the decision to deploy nuclear power rather than using other power generation technologies. On the other hand, an organization operating an existing nuclear facility will wish to demonstrate clearly to the public that it is acting in full compliance with applicable safety regulations, that its staff is competent and knowledgeable and that its activities benefit both the local and national community.

A regulatory body's objectives at the programme development stage might be greater public understanding of the regulator's role in decisions required for the project to progress. Throughout the life cycle of a nuclear programme, a regulator may have an objective to ensure that the regulatory body is viewed as effective in protecting public health and safety and is the body that the public can consult as an independent and trustworthy expert.

Because these objectives will differ for each organization implementing a stakeholder engagement programme, development of each organization's strategy will require close coordination with other involved organizations. This is especially useful in terms of integrating certain elements of the communication plans, including messages and techniques. For example, it is common for a programme of events or meetings to be arranged with expert speakers from the various government, regulatory and owner/operator groups to reinforce the interrelated nature of responsibilities of the various groups [9].

3.3.3.3. Scope

It is important to describe what the strategy does and does not cover. For example, the strategy might include stakeholder engagement activities related to nuclear power, including public information, coordination among key organizations and engaging with other identified stakeholders. But it is important to clarify whether certain categories of stakeholder engagement, such as emergency preparedness communication, are covered elsewhere and not in the scope of this strategy.

3.3.3.4. Key stakeholders

The list of identified stakeholders will differ from country to country and will change over time. Each stakeholder group will have specific information needs and expectations, which may be addressed in different ways depending on the stakeholder profile and the issue under consideration. This is why it is crucial to fully understand each stakeholder group in terms of its self-stated (or underlying) purpose, its interest or concerns (not always explicitly expressed) related to the respective nuclear programme, its expectation of information and engagement in decision making and the communication techniques best suited to the group.

Given the time frames associated with the life cycles of nuclear programmes, it is optimal to develop long term relationships with the various stakeholders and develop levels of trust and confidence in the information that is provided [10]. During the stages of the nuclear life cycle, different stakeholders will assume varying importance. In particular, it is vital that engagement with younger generations is a focus of any stakeholder engagement process, given that its members will be affected throughout their lives and are the decision makers of the future.

After developing a complete list of potential stakeholders, it is also valuable to perform comprehensive stakeholder mapping, as illustrated in Figs 2 and 3. There are various ways to identify and prioritize stakeholders. After mapping broad stakeholder groups, it is also useful to specify particular individuals or organizations within each group to communicate with. For example, are there particular union leaders or members of media to be addressed?

Special consideration — conduct stakeholder mapping as a team exercise:

— A stakeholder map allows internal staff to align their understanding of stakeholders and to work together on plans for engagement. The map provides direction on which stakeholders need to be engaged with at what time, in which way, and for what strategic reason. During the mapping exercise, staff can identify and resolve any disconnects about the importance of certain stakeholders and how to engage with them.

3.3.3.5. High level messages

In any stakeholder engagement programme, clear goals with measurable steps to reach them are supported by simple, concise messages that resonate with target audiences. A compelling message takes into account what will work with the audience to build trust.

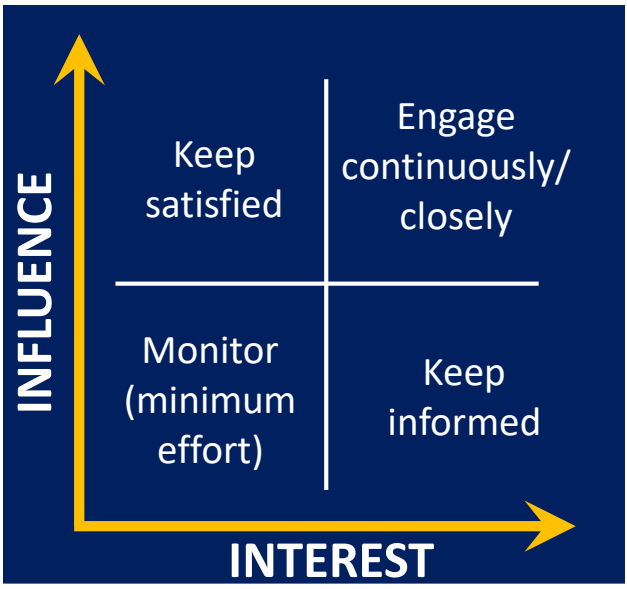


FIG. 2. Example of a stakeholder mapping matrix.

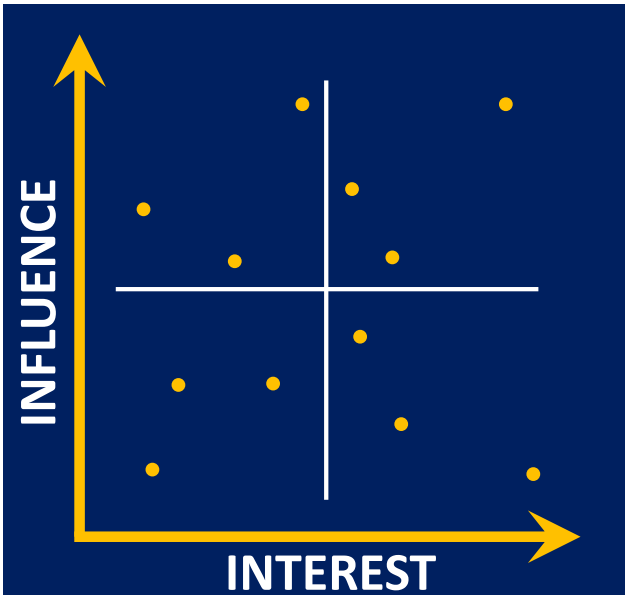


FIG. 3. Illustration of groups on a completed map.

Wherever possible, messages with supporting statements need to be consistent and part of ongoing communication, and those involved be prepared to respond to stakeholder input in a manner that builds mutual respect [10].

It is essential to research and subsequently address the major public issues in the country or locality. Looking initially at public concern over issues such as national energy supply and independence, economic conditions and growth or the use of natural resources can help determine the degree of emphasis on certain messages as part of a given country's focus on national issues during various stages of the nuclear life cycle.

Special consideration — test key messages:

— Testing key messages can provide insight into how well they are received and their overall efficacy. Testing can be accomplished through focus groups or polls or by requesting feedback directly from stakeholders.

3.3.3.6. Timeline

Many activities can be anticipated as various organizations move through the milestones of nuclear programmes and facility development: decision to proceed, partnership with international vendors, construction, commissioning, commercial operation, human resource expansion, labour negotiations, refuelling outages and so forth. As the stakeholder engagement strategy and associated plans are implemented, having at least a general timeline can ensure clear, consistent messages to appropriate stakeholders.

3.3.3.7. Resources

Given the recognition that stakeholder engagement is essential throughout the life cycle of all nuclear programmes, organizations in the nuclear field need to ensure that the number and competencies of its staff are consistent with their assigned responsibilities [11]. Having the right mix of skills among staff who will be involved in the stakeholder engagement programme from the beginning is important. In the past, nuclear technology professionals have often taken the lead in such programmes; however, the need to include professionals in social sciences such as communication, opinion surveys and organizational psychology on the team is broadly recognized. Furthermore, it is important that technical staff called upon to take part in the various activities within the overall strategy are selected based both upon their technical competencies and their communication skills. They need to be provided with training in effective communication consistent

with their communication roles, particularly those who interact with the media and the public.

Training in risk communication also needs to be encouraged for communicators, policy makers, implementers and regulators. It has long been recognized that there can be an imbalance in the public perception of environmental and societal risks of nuclear technologies compared with the perceptions held by scientific and policy experts [12]. With regard to nuclear power, and nuclear waste disposal in particular, the public can have deep-rooted concerns about safety and risk, while those who work in the nuclear industry consider the technology to be safe and reliable.

The scale of a stakeholder engagement programme will be dependent on the combination of the objective, goals and available resources for the strategy. These will, in turn, impact the selection of appropriate techniques and allocation of time and effort to the different stakeholder groups identified. For example, if the goal is only to impart information, implementing the plan will require significantly fewer resources than if the intention is to enter into an active two-way engagement.

Prioritizing stakeholders and issues is vital to determining the allocation of time and finances. Time or money spent on a high priority stakeholder group may influence a lower priority stakeholder group without additional resources being dedicated to that group.

3.3.3.8. Tools, methods and approaches

The strategy needs to provide general information on the communication channels and tools to be used to deliver messages to relevant stakeholders. This needs to include a discussion of why various types of interpersonal, written or digital communication are most appropriate for achieving the objectives of the strategy without mapping out specific deliverables for various stakeholder groups, which would be done at the planning level. Any challenges anticipated in the creation or dissemination of communication tools and materials have to be included in the strategy.

3.3.3.9. Evaluation

It is important to periodically review even well-designed plans and amend them as necessary, based on changing circumstances and stakeholder feedback. For this reason, irrespective of the scale of a plan, it is important to include an evaluation component. Effective use of evaluation will allow those responsible for planning to judge the success of different techniques and approaches throughout

the stakeholder engagement programme and have to demonstrate where changes and improvements are necessary.

Evaluations at some regular interval after certain elements of the plan are put in place provides insights into the plan's effectiveness and where adjustments need to be made [13]. The appropriate frequency — annually, quarterly or monthly — depends on the circumstances, the type of evaluation and the budget. Regardless of the cycle, a regular commitment to evaluating the effectiveness of the strategy based on its objectives can help to maintain strong and positive relationships with the various stakeholders [10].

A comprehensive programme of opinion research includes a variety of techniques (see Appendix III). Written, telephone or digital surveys are ideal for collecting evidence of an audience accepting a message, but other measures such as focus groups can be applied as well. For example, staff can conduct brief follow-up interviews with opinion leaders after a major activity or after a given point in time for the project, such as one year intervals. The number of inaccurate or biased representations in the media is an indication of success or failure in reaching that audience. An increase in public requests for printed materials or site visits is another measure that general interest or awareness is being achieved.

These examples of evaluation techniques illustrate the need to quantify project support while also collecting deeper insights through qualitative steps such as discussions and interviews with those stakeholders who took part in various aspects of the programme.

Evaluation using a combination of objective and subjective measurement needs to take place early in the nuclear programme and frequently thereafter. In the initial stages, it is necessary to understand the level of knowledge about the issues by the various target audiences, ideally before initial communication begins or as early as possible in the process. An initial evaluation helps to make the subsequent use of various messages and techniques more focused and productive.

3.3.4. Build a stakeholder engagement plan

Stakeholder engagement plans outline the specific steps for implementing the associated strategy. Many elements of the plans are taken directly from the stakeholder engagement strategy, yet plans will require additional levels of detail outlining actions to be taken. Components of the plan elaborated on below include targeted stakeholders, messages, channels/tools, deadlines/timing, and resources.

3.3.4.1. Targeted stakeholders

From the stakeholder groups found in the strategy, a list of specific individuals and organizations would be the focus of the plan. The list identifies the main stakeholder groups to address at each particular stage of the nuclear life cycle.

A comprehensive plan will also include stakeholder groups who may not be the primary focus but may be secondary audiences, especially if their support or accurate understanding of nuclear matters is instrumental in influencing the primary stakeholders. One way to achieve this is to identify stakeholders whose support of or opposition to a development would be significant, or who have particular information or expertise to offer, including certain non-governmental oragnizations (NGOs) and technical groups such as engineers or labour unions, academics or other respected figures, national bodies and business groups. Many of these third parties may emerge as opinion leaders of the nuclear programme and can be important in serving as influencers of public support. When a facility at a specific or proposed site is involved, certain local community stakeholders will also need to be included, for example, interested individuals, local businesses or representatives of residents' associations, clubs or faith groups.

Special consideration — be specific about stakeholder groups:

— Wherever and whenever possible, resist the inclination to map 'the general public.' While this might be true in a very broad sense, experience has shown that it is more effective to focus on specific stakeholder groups who can actually affect change. This is also true for groups like 'the media' and 'NGOs.'

Comprehensive stakeholder engagement also means involving and engaging both internal and external stakeholders. A plan for involving internal stakeholders supports the cohesive delivery of organizational messages and the different responsibilities of colleagues with regards to communication. External stakeholders are outside an organization and can affect or be affected by a programme or a project. In working with international partners, transparency regarding the responsibilities and relationships of respective organizations can influence public perception. Communication with members of the international partner organization needs to be factored into the stakeholder engagement plans.

3.3.4.2. Messages

It is essential to have consistency between what is said to different audiences, but also to recognize the emphasis on certain aspects of the message or complexity of what is said to different groups. For example, the use of plain language will be essential when communicating with non-technical audiences. After identifying which specific stakeholders will be addressed in the stakeholder engagement plan, it is also important to tie particular messages of greatest interest to each group.

While it is crucial to have alignment of high level key messages that are frequently repeated, it is also important, for the wider engagement plan, to ensure that staff remain ready, authentic and well informed to address a wide range of questions and concerns. For example, question and answer periods cannot be predicted to any level of detail and having the capability to respond with empathy and credibility is key.

3.3.4.3. Channels/tools

If careful consideration has first been given to identifying the objective and goals of the strategy, and then in identifying and prioritizing stakeholders and the issues of primary importance to each group, the task of selecting the most effective tools and engagement techniques is greatly facilitated. A variety of engagement techniques and tools need to be used so that they address the issues in mutually reinforcing ways. It is important to recognize that no one type of tool or format in itself will successfully communicate the intended messages to all stakeholders; a variety needs to be used. As the media landscape evolves, basic assumptions regarding the most effective or appropriate channels to use need to be challenged and deliberated. Each channel offers a unique set of advantages and disadvantages in terms of cost, speed of delivery, control of messages and other factors.

In deliberating the channels of choice, one important matter to note is that while numerous options are available, not all need to be used. An organization needs to plan deliberately which channels will help meet the objective.

Whether to use written, digital or face-to-face communication will depend on the size and type of the audience to be reached, the desired results expected from the communication technique, the resources available including time, money and personnel, and the kind of engagement being sought.

Irrespective of which technique is used, it is important to be consistent in the presentation of the key messages and to evaluate the effectiveness of a particular tool to communicate the issues being put forward.

(a) Interpersonal communication

A wide range of personal interaction techniques can be used to carry out a stakeholder engagement plan. Different formats would be chosen, depending on whether the intention is merely to inform or to encourage dialogue. Combining various types of interpersonal communication tools can build both general awareness and active engagement leading to project support. References [14–18] provide information on techniques for particular stakeholders and situations.

Examples of interpersonal communication tools are:

— Social responsibility programmes;
— Booths in exhibitions;
— Project presentations to large groups or open-invitation public meetings;
— Tours of facilities including plant sites and public information centres (see Appendix IV for more information);
— Open house days for employees' families or members of the local community;
— Town hall meetings and public hearings;
— Specialized staff interacting with stakeholders to respond to or discuss topical requests;
— Press conferences;
— Workshops, seminars, training exercises and conferences.

Special considerations — interpersonal communication:

— Advantages:
    - Tailored and personalized;
    - Interactive and adaptive;
    - Affordable if little travel is involved;
    - Allows complex information to be explained;
    - Familiar context can enhance trust and influence.
— Disadvantages:
    - More narrow reach;
    - Time consuming;
    - Potential increased costs for staff time and support materials.

(b) Written materials

Materials produced by project managers offer the greatest degree of control of content; however, they can be costly to produce and distribute and may not be viewed as being as objective as the same information written and published by news media or third parties. Billboards, banners, newspaper advertising and

news releases are just a few of the methods for reaching a particular audience with a certain message. Most of these are intended primarily to provide one-way information; however, they can include contact information for an interested stakeholder to seek additional information. Many of these written materials might be provided in advance of or during a public meeting to help ensure meeting participants better understand the discussion. On-line posting and dissemination where possible facilitates greater reach.

Examples of written communication tools are:

— Press releases or advisories;
— Brochures;
— Newsletters;
— Printed surveys;
— Questions and answers or fact sheets;
— Testimonials or written opinion pieces from third parties.

Special considerations — written communication:

— Advantages:
  - Extensive and quick reach;
  - Reinforces messages through efficient and consistent repetition;
  - Sets the agenda — what is important and how to think about it.
— Disadvantages:
  - Two-way interaction is limited;
  - Can be costly to produce.

(c) Digital platforms

Information can be distributed via the Internet, television, radio and other digital channels. Social media platforms are effective with both external and internal audiences, and organizations with structures that facilitate rapid approval of messages and prompt interaction are ideally poised to successfully use social media. As with other communication tools, communicators on social media need to be well-trained and familiar with the key messages of the organization. Digital media including the Internet and social media are particularly interactive and allow for two-way communication, such as by allowing for questions to be raised then answered through a variety of on-line mechanisms. Links to digital materials allow for easy access to information.

Examples of digital or electronic communication tools are:

— Social media platforms (See Appendix V for guidance on a social media strategy);
— On-line surveys;
— Internet sites;
— Videos;
— Films and documentaries;
— Television or radio interviews.

Special considerations — digital communication:

— Advantages:
  - Extensive reach for most stakeholders;
  - Interactive;
  - Shareable;
  - Flexible and may be able to adapt as needed;
  - A range of cost options, including virtually free for social media.
— Disadvantages:
  - Can require specialist multimedia skills;
  - Might limit accessibility to certain stakeholders;
  - Source of information can impact credibility;
  - Time consuming to monitor and address.

The use of modern digital information sharing media such as social media and the Internet can be successfully combined with the continued use of traditional forms of print or broadcast communication.

3.3.4.4. Deadlines and timing

For effective stakeholder engagement to materialize, it is instrumental to establish deadlines to facilitate the smooth roll-out and delivery of messages. The establishment of a timeline in the form of a calendar will also assist communicators to align activities or events with national policy developments and nuclear programme implementation milestones.

3.3.4.5. Resources

Having established the primary elements of the plan, it is essential to set out the budget and resources required for its implementation in order to assess how

much of these are already secured and what gaps in human or financial resources need to be addressed to fully implement the plan.

It is also necessary for the plan to be specific about who has responsibility for developing and delivering each of its elements by the deadlines outlined in the plan timeline.

3.4. IMPLEMENT THE STAKEHOLDER ENGAGEMENT STRATEGY AND PLAN

A stakeholder engagement strategy can only be put into action if it is supported by strong leadership, includes clear and coordinated messages, and has associated plans for implementation. In this way, meaningful stakeholder engagement can be implemented and sustained over time. Stakeholder engagement needs to be an integral part of managing nuclear programmes from conception through final closure. Thus, implementation of the strategy and plans will need to include mechanisms to continually monitor and evaluate the effectiveness of the overall engagement programme and make changes and improvements accordingly. The most important consideration is whether or not the strategic objectives of the programme are being achieved.

4. ROLES AND RESPONSIBILITIES OF KEY ORGANIZATIONS IN STAKEHOLDER ENGAGEMENT

The key organizations for stakeholder engagement in a nuclear programme are:

— National government;
— Nuclear regulatory body;
— Facility owner/operator.

In the case of a new nuclear programme, exactly who the decision makers are in each stage will vary depending on national legislation, regulations and norms. However, often the main decision maker in the early phase is the national government, whose task it is to introduce a nuclear programme and establish a legal and regulatory framework and establish the main organizations. The later phases encompass a number of decision makers, government ministries, the operator/owner organization and the regulatory body. Even local authorities may,

in the second phase, be regarded as decision makers, though they always are considered as one of the main stakeholder groups.

To develop trust in their announcements and deliberations, the organizations involved have to coordinate their communication activities, while at the same time demonstrating their respective roles and responsibilities. The government, owner/operator organization and the regulatory body need to each develop their own information and education activities and engage in public dialogue as they form, and they need to each exercise their responsibilities through their stakeholder engagement programmes [4]. In particular, the regulator's role as an independent and competent body is important to establish in communication. It is vital for the regulator to publicly demonstrate independence from political or industry influence in its decision making and deliberation.

4.1. GOVERNMENT

At the national governmental level, a number of ministries are likely to be involved in a nuclear programme. These could include, among others, the Ministry of Energy, the Ministry of Industry/Economic Affairs, and the Ministry of the Environment. They will need to consult with each other and reach consensus for the programme to progress. Decisions concerning a nuclear programme involve major expenditures and public interest. As such, all decisions related to a nuclear programme need to be based upon a well-defined and knowledgeable national position, founded, among other considerations, on sound studies and energy planning. To ensure that all necessary information is available to make an informed decision, this consultation process would involve, on the demand side: politicians, policy makers, energy experts, economists, nuclear experts, legal experts, academics and other stakeholders, including the general public and media, and on the supply side, consultation would involve utilities and members of industry [19]. Measures for safety, security and non-proliferation of a nuclear programme need to also be communicated by the government.

Government officials act as sponsors on behalf of the public. Members of the public look to their representatives to make sound judgements based on facts. The public also wants to see that decisions made by government leaders are without undue bias or influence. Even when briefings, meetings or site visits by government officials are closed to the public, there needs to be public awareness that such meetings are being conducted, what decisions are being discussed and why an open forum is not feasible in this case, and if or when the conclusions of such meetings will be made public.

Local government officials have an important role in communicating with all key organizations involved in a nuclear project in their municipality. They

are typically the bridge between a nuclear project and a local host community. Depending on the makeup of governmental responsibilities, decisions on energy policy may be taken at the provincial/state level in some countries.

The transition between national policy decision making and local engagement in decision making is approached differently across Member States, once a site for a facility has been selected. However, this transition occurs, effective stakeholder engagement can be vital in gaining and maintaining public support.

4.1.1. Nuclear energy programme implementing organization

For a new nuclear power programme, the government will need to establish a mechanism to coordinate efforts among the many organizations and individuals with roles in considering and developing such a programme. The nuclear energy programme implementing organization (NEPIO) designation is used by the IAEA for illustrative purposes only. The government may organize the mechanism in a manner most appropriate to its own customs and needs [Refs 4, 20].

4.2. OWNER/OPERATOR

The nuclear plant owner/operator may be state owned or private, be part of a domestic or international utility or be another commercial entity. Given the government decision to introduce, expand or decommission a nuclear facility, the owner/operator is responsible to stakeholders for explaining the technology during the planning, construction and operational phases, the impacts on specific stakeholders such as the local community, how positive impacts will be achieved and how any negative impacts will be mitigated. The owner/operator works to gain support from stakeholders, therefore allowing the programme to progress through implementation. It also addresses concerns and questions from stakeholders, explaining the basis for decisions made. Ultimately, successful stakeholder engagement involves key stakeholders in such a way that those stakeholders eventually share in the ownership of nuclear programme successes and communication outcomes.

To a certain extent, this may overlap with the government's information on its nuclear policy, but the owner/operator is not responsible for communicating the rationale for the government's decisions.

The owner/operator develops public information activities and materials to facilitate the public's understanding of the project.

Some of the main issues that the owner/operator has to focus on for stakeholder engagement are:

— Benefits and risks of the nuclear technology;
— Project updates, including milestones and schedule;
— Siting (facility introduction, expansion or decommissioning);
— Construction oversight;
— Safety of operation;
— Operational updates;
— Emergency preparedness and response;
— Waste management plans;
— Effects on specific stakeholders.

4.3. REGULATOR

The nuclear regulator has to be an independent body that regulates the safety, security and safeguarding of nuclear activities and facilities to protect human health and the environment. As required in GSR Part 1 [21], "the government shall ensure that the regulatory body is effectively independent in its safety related decision making and that it has functional separation from entities having responsibilities or interests that could unduly influence its decision making." The decision making of the regulatory body is done at arm's length from government and industry influence and made by credible technical experts in the nuclear field. The regulator does not promote the use of nuclear technologies.

A nuclear regulator has a responsibility to establish and maintain a rigorous stakeholder engagement programme where it informs the public on how it makes decisions and demonstrates its expertise and independence. The regulator's role includes giving unbiased information about aspects of the nuclear programme related to risks and safety, security and non-proliferation, as well as recommending improvements.

A significant aspect of the communication process for a regulatory body is in the area of licensing and authorizations. Most countries have established legal obligations on regulatory bodies to consult during the licensing process in an open and inclusive way with key interested parties, including anyone living near facilities and activities. It is important for regulators to develop clear arrangements for stakeholder engagement in licensing processes. For certain activities, many regulators incorporate open comment sessions in their public meetings [12]. This approach can be hampered by difficulties in public access to documents or in having suitable security clearance for attendance when sensitive security issues or information are being considered.

The regulator plays an important role in ensuring safe practices by the owner/operator. Therefore, its stakeholder engagement programme focuses on, among other things, independence, freedom from bias, expertise, safety messages and enhancing trust in the decision making process. The regulator is involved at all stages of a nuclear facility's life cycle and may choose to coordinate its stakeholder activities with industry and government as long as the evidence of independence is clear.

5. STAKEHOLDER ENGAGEMENT IN THE LIFE CYCLE STAGES

A nuclear facility's life cycle — including operating and new reactors, all aspects of the nuclear fuel cycle, from uranium mining to spent fuel and radioactive waste management, decommissioning, and non-power applications — can vary widely from 10 to 20 years for a uranium mine or mill, to 60 to 100 years for a nuclear power plant, or centuries and more for nuclear waste facilities. This is why sustained, long term stakeholder engagement is a critical component of nuclear projects and facilities.

This section provides some key considerations when developing and implementing a stakeholder engagement programme at each stage of a nuclear facility's life cycle.

It is important to emphasize that stakeholder engagement is a mandatory component of various international conventions and treaties that detail the role of governments and developers in the strategic environmental assessment (known as SEA) and environmental impact assessment (known as EIA), not just for nuclear facilities. Reference [22] provides detailed guidance on strategic environmental assessment. Development of a major national policy, such as the introduction of a nuclear programme, may be subject to strategic environmental assessment requirements, and specific facilities and activities may be subject to environmental impact assessment requirements. While not all Member States are signatories to the relevant conventions and treaties, such as the Aarhus Convention, the Espoo Convention, EURATOM or various European Union Directives, many of these instruments incorporate responsibilities to neighbouring countries. As such, many countries will find themselves obligated to incorporate at least some level of stakeholder engagement during all stages outlined in this section.

5.1. STRATEGIC DECISIONS FOR A NUCLEAR PROGRAMME

In the early stages, the issues tend not to be site specific, and policy decisions are often made between relevant authorities and affected stakeholders that may not include significant representation from the public at large [23]. High level stakeholder engagement strategies have to have been developed and implemented prior to the decision to proceed with a nuclear programme in order to sensitize the public to the idea, showcase the benefits and risks early and to highlight milestones, including when and how stakeholders will be involved at each stage.

Using the example of a nuclear power programme, activities at the early stage may include:

— A national exhibit on sources of electricity and various energy technologies in a major city;
— Lectures or panels featuring experts such as those from government agencies or universities on the role of energy policy for national growth;
— Media opinion pieces on the need to evaluate and expand a national energy policy.

A proposal to develop a nuclear power programme will inevitably result in considerable debate, first nationally then locally when specific sites have been identified, but also potentially with neighbouring countries. Relationships established during this early stage of programme development can prove invaluable later during operation and subsequent decommissioning. Mutual trust between partners strengthens the sense of shared objectives and encourages open and honest communication. In the case of new generating capacity, greater awareness of a national energy policy is an appropriate focus for early communication [24].

The issue of a safe and sustainable strategy for waste management, in particular in the handling of high level waste and spent fuel, transcends all of the stages described in this section and is also important to be addressed, in that this topic causes stakeholder concerns. Member States have to be prepared to address radioactive waste disposal regardless of what stage the project is in. Furthermore, while most nuclear facilities have a lifetime of less than a century, repositories are designed to carry out their function for periods from several centuries to millions of years, albeit such very long term protection goals are met by so-called ‘passive means.’ Therefore, with regards to stakeholder engagement, these activities require deliberate and planned communication. Demonstrable successes in decommissioning and waste management may increase public confidence in nuclear programmes more broadly.

5.2. SITING

The issue of specific facility siting can be extremely contentious. Even when a satisfactory level of public support for a nuclear programme has been developed, new reactors can be difficult to site as can waste storage or disposal facilities. Initial points raised by a facility proponent often stress benefits to the local community, which would stimulate the local economy in different ways. Such benefits can include new employment opportunities and tax and other incentives [25]. Experience has shown that local stakeholder engagement planned at the earliest stages of site investigation helps to avoid a perception that a nuclear facility is being forced upon a local community without an opportunity for its input.

Activities at the siting stage may include:

— Formation of public advisory councils or committees in the communities being considered for siting. While local public citizen groups may have differing titles and forms of representation in various Member States, a group that includes representatives of local businesses and NGOs as well as others such as religious communities facilitate valuable two-way communication in support of stakeholder engagement principles. It is important to note that businesses and NGOs may fall into two categories: those that are supportive of the nuclear programme (for example energy-intensive companies) and those that are not (for example traditionally environmental organizations, farms or companies in the tourism sector).
— Activities for local teachers and school children to broaden their awareness of nuclear science and technologies. Education campaigns in schools can be a powerful tool to disseminate the key messages of the nuclear programme, not only with the students and teachers but also with their families.
— Regularly scheduled media briefings and written updates.
— Site visits for local communities to similar existing facilities at other sites in-country or abroad.

For all facilities, one common approach taken is for interested communities to be invited to volunteer their locations for potential development (provided they are geologically/ logistically suitable) as opposed to making top-down, imposed siting decisions. In many cases, communities are presented with prospective benefits, both social and financial, and are able to decide whether or not to volunteer to be considered as a potential site. It is important that these opportunities are presented as a service the local community is providing to the national community, although opponents may describe benefits as some form of impact mitigation or bribe to the local community. In addition, the word

'compensation' is to be avoided when describing the support/benefit package, since it creates an image that harm has been done, which needs to be compensated. However, provision of these benefits does not remove the need to recognize and respond to the community's reactions with respect to perceived impacts such as effects on property values and other forms of potential stigmatization [26].

It is important at the site selection stage to develop decision making processes that incorporate comprehensive local stakeholder engagement, to provide for local participation in those aspects of the process that most affect them, and in which they can have some influence on the outcome. The subsequent emergence of plans about which local stakeholders were unaware can cause irreparable damage to relationships and harm hard won trust that has taken months, even years, to build [27].

5.3. CONSTRUCTION

It is recommended that the nuclear plant owner/operator communicates the progress and each milestone to relevant stakeholders in an open and transparent manner. Although each organization will have its own list of stakeholders, stakeholder engagement plans will typically include the local community, media, authorities and educational institutions and also need to include different activities for each group. The preparation of such plans to communicate with stakeholders are also useful in case of debates in the media, in national or local government bodies, or if there are demonstrations against the construction project.

Activities at the construction stage may include:

— A short programme on a local radio station giving general information about nuclear technologies and nuclear plants as well as the progress about the ongoing nuclear plant project. This can be organized by the owner/operator so the local community can be kept informed in a transparent way, contributing to building trust.
— A social responsibility programme that could include addressing the needs of the local communities, such as the improvement of roads, schools and hospitals.
— An in-depth tour of the construction site enabling small community groups to visit parts of the facility that will not be accessible during operation. The public relations team can give a short presentation and respond to questions that the public has about the progress, risks and benefits of hosting a nuclear facility in the community.

5.4. OPERATION

Stakeholder engagement and communication on a regular basis during facility operation have to include updates on safety levels and other performance related issues, such as power output level, availability factor or refuelling outage schedules, in addition to other interesting information related to the nuclear programme. This can take place via stakeholder groups established as representatives of the community and through responsible authorities.

Activities during operation may include:

— A notification process used to keep local officials informed of operational evolutions, especially those that may affect the local community, such as refuelling outages;
— Seminars, science camps and other technical events that address stakeholders whose support for the nuclear power programme may be waning, based on insights gleaned from evaluation activities;
— Facility tours for key national media representatives.

It is important to remember that many facility staff will also be members of the local community and can be good community ambassadors. Development of long term projects such as improved roads, hospitals or emergency response facilities are increasingly common, especially if they enhance nuclear operations while benefiting the local community in other ways. Many facility operators see these as an important part of their social responsibility efforts [28]. Facility operators also often strengthen local communities through support for local businesses, sports and education [25]. Distribution of local taxes or community support grants can effectively be delegated to community groups or special committees.

5.4.1. Capacity increases, life extensions and site expansion

Member States may seek to extend the operation of existing nuclear power plants beyond their original design or licensed time frame, increase the rated power output from their reactors, or build additional reactors at existing plant sites. This may require amendments to existing legislation or regulation to enable capacity growth. Such significant decisions often warrant national governments and operators to consult extensively with all relevant stakeholders. Stakeholder engagement approaches used during the development phase of a nuclear programme decades earlier may bear little resemblance to the stakeholder engagement needs later.

For new reactor projects at existing sites, it will be important to demonstrate that initial siting justifications remain valid, or that from all perspectives, including technical and socioeconomic ones, the expansion of facilities is acceptable and sustainable. The increased economic benefits from such an expansion will often outweigh other local concerns, especially because the benefits from an existing reactor are tangible, not just conceptual as they were during initial facility deliberations. On the other hand, difficulties in developing acceptable waste disposal facilities have the potential to cause elevated concerns, given that it may be necessary to implement interim management solutions such as on-site storage, possibly contrary to original plans.

As in all cases, when communicating the rationale for nuclear capacity growth, care has to be taken not to present misleading or oversimplified facts, which could damage the credibility of other stakeholder engagement measures.

Communicating inspection results of operating nuclear facilities is an excellent way to demonstrate independent oversight and can help develop and increase stakeholder confidence in competent authorities. Difficulties can arise regarding the treatment of security related issues in terms of stakeholder access, but if openness is encouraged and authorities strive to involve stakeholders when and as much as possible, the public is more likely to accept the need to keep security related information confidential [11]. There will be continued engagement of statutory stakeholders such as regulatory bodies and government agencies, as the safe operation of the facility will be subject to strict, ongoing inspection and review.

5.5. DECOMMISSIONING

Engaging stakeholders on decommissioning builds on the continued trust and confidence in the operator and regulator that was developed during operation. A decommissioning strategy, including its funding, needs to be developed in the early stages of a project and communicated long before decommissioning actually begins. The consequences of facility closure on the local community are not be underestimated. Experience shows that even where a local community was originally against the development of a nuclear facility, they are usually also against its closure, especially if there are no plans for a replacement. The effects of closure at the end of a nuclear facility's operating life are both national and local, and open dialogue and communication need to be established between the operator, regulator and local stakeholders early in the process. Decisions regarding closure of nuclear facilities, particularly reactors, may be due to financial considerations or safety concerns. In most countries, local communities have a role in the decision to choose a site for a new facility; in

several countries, municipalities have a formal right of veto. Local communities typically have less power in the case of a decision to close a facility, and do not have the right of veto [29]. However, the impact upon the host community can be such that subordinate decisions regarding decommissioning and environmental remediation processes, site reuse and local economic diversification are likely to be of major importance. Engaging relevant stakeholders is therefore essential.

The trust and confidence developed between all parties during facility operation needs to be maintained during the decommissioning process. Shared decision making regarding on-site reuse and economic impact mitigation is an excellent way of sustaining this trust [29]. Providing accurate and easily understandable information on a regular basis using a range of communication techniques is a fundamental premise. It is also important for local communities to be able to continue depending on the regulatory authority for providing information in addition to and independent of that from the owner/operator.

Activities at the decommissioning stage may include:

— A blog or other digital communication that shows photos and video of decommissioning activities as they progress;
— Meetings with local opinion leaders on changes in the owner/operator's social responsibility programme and other impacts to the community based on the facility ceasing to operate;
— Media releases providing accurate and consistent information about the decommissioning process and status.

Closure of a facility results in decisions regarding waste management that may be beyond the influence of local stakeholders. What to do with accumulated waste, including that resulting from the decommissioning process, is an integral consideration in a national strategy.

Although continued use of the site will offer some employment opportunities, this is likely to be on a smaller scale than was the case during facility operations. Close coordination and communication between the government, the organizations responsible for the waste and the local community about the developing situation will be crucial. A number of decisions may be made locally, including participation in monitoring of potential health impacts from decommissioning activities, socioeconomic impacts from reduced employment and local purchasing [29], and future use of the site.

An abundance of experience in the decommissioning field highlights effective engagement efforts. For example, local oversight of decommissioning and cleanup activities at closed nuclear facilities is considered good practice. There is a movement towards establishing groupings of affected communities into national and international bodies able to share their experiences in support

of communities newly impacted by facility closure, such as Nuclear Legacy Advisory Forum (NuLeAF, United Kingdom), Asociación de Municipios en Áreas con Centrales Nucleares (AMAC, Spain), Energy Communities Alliance (ECA, United States of America) and Group of European Municipalities with Nuclear Facilities (GMF, Europe). National agencies, facility operators and waste owners would do well to maintain good communication with these bodies in order to demonstrate their intention to have open and constructive relations with their local communities.

6. CONCLUSION

Decisions regarding any type of nuclear programme receive considerable attention from the public and other stakeholders. Regardless of the stage in the life cycle of the nuclear programme — initial consideration, implementation or closure — properly addressing stakeholder needs and concerns improves the probability of programme success. It is essential to engage stakeholders as early as possible and with ongoing tailored attention, including underscoring their role in decision making processes.

Although decision making processes vary considerably by Member State, depending on social context, history and governmental structure, it is nonetheless advisable that all entities primarily responsible for nuclear programmes create strategies and plans for stakeholder engagement. There is no one ideal model for stakeholder engagement, nor is effective stakeholder engagement a guarantee that a nuclear project will succeed. The approaches depend on the nature of the nuclear programme, the point in its life cycle, legal norms and other factors.

Continual assessment of the stakeholder engagement programme is necessary to ensure that it continues to achieve its goals and objectives, as well as to determine if these objectives continue to be relevant. Active involvement of stakeholders in evaluation of the programme is vital [15].

Stakeholders will have a range of opinions regarding the proposal, operation, expansion or closure of a nuclear facility, based in part on whether they are national or local in nature and from which perspective they view a project: that of elected officials, businesses, environmentalists, emergency planners, educators or interested citizens or workers, to name but a few. Fundamentally, stakeholder engagement requires a genuine intention to understand the concerns, perspectives and interests of others in order to work together. The derived relationships and partnerships become crucial building blocks for long term decision making and successful project implementation.

Appendix I

TEMPLATE FOR A STAKEHOLDER ENGAGEMENT STRATEGY

Table 1 is a sample template providing guiding questions to draft the basic components of a stakeholder engagement strategy for a nuclear power programme. Posing these and other guiding questions can help formulate the text of a stakeholder engagement strategy document based on informed input. The conceptual approach of this template can be used for other types of nuclear projects as well.

TABLE 1. GUIDING QUESTIONS FOR DRAFTING A STAKEHOLDER ENGAGEMENT STRATEGY

Strategy components	Guiding questions
Introduction, including background/situation analysis	
Describe the energy and socioeconomic situation of the country and the national strategy for civilian nuclear power. Describe stakeholder engagement activities related to nuclear power to date, including public awareness and opinion, if it is known. This section would contain a situational analysis of the current versus the desired situation.	• Why is a nuclear power programme being considered or expanded?
Objectives	
Briefly provide the purpose of the stakeholder engagement strategy in a few short paragraphs that outline what the strategy will aim to accomplish.	• What has led to this engagement activity? • Is there opportunity for stakeholders to influence decisions, policy or the project? • What knowledge do you have that you can build on? • Is everyone clear about the decisions to be made? • Does the purpose statement reflect the needs of the decision makers and stakeholders? • What is the purpose for communicating key programme messages?

TABLE 1. GUIDING QUESTIONS FOR DRAFTING A STAKEHOLDER ENGAGEMENT STRATEGY (cont.)

Strategy components	Guiding questions
Scope	
Describe what the strategy does (e.g. stakeholder engagement activities related to nuclear power, including public information, coordination among key organizations and engaging with other identified stakeholders) and does not cover (e.g. communicating with the public in a nuclear emergency).	• What aspects of the overall nuclear programme development will be separate from this stakeholder engagement strategy?
Key stakeholders	
List the stakeholders who have been identified (statutory as well as non-statutory) and include some form of prioritization based on their levels of interest in and decision making power for the nuclear power programme (be as specific as possible).	• Will these stakeholders help to achieve your objectives? • Are you involving them because you need input to decide how to implement the plan? • Is there a high level of community impact? • Is the programme politically sensitive? • Who are you aware of that has: A direct and clear interest? A general interest? An ability to influence? • Who may not be interested but will be affected by the decision? • Which geographic areas do you want messages to reach? (Are there any areas that should not receive the messages?) • Who needs to know details about your programme?

TABLE 1. GUIDING QUESTIONS FOR DRAFTING A STAKEHOLDER ENGAGEMENT STRATEGY (cont.)

Strategy components	Guiding questions
High level messages	
List up to five key messages related to the nuclear programme.	• What are the three to five key messages you want stakeholders to understand about the nuclear programme in order for the programme to succeed? • What questions do people ask staff during programmes/events? • What would you want to know about the programme if you lived in the community? • Is there any information that should *not* be shared, given the context?
Timeline	
Identify the major steps in the nuclear power programme to which the stakeholder engagement strategy needs to be closely aligned (e.g. national decision to embark on a nuclear power programme, technology and vendor selection, site selection, issuing of key licences, construction, fuel delivery, first criticality, etc.).	• What are the key activities in your programme? Which ones need to be preceded by information sharing? • Does the calendar of events allow for impromptu changes? • When will you share key information or updates with the different audiences?
Resources	
Briefly describe the necessary adequate human and financial resources for stakeholder engagement and anticipated expansion of resource needs as the nuclear power programme moves through the outlined time frame.	• What is the total budget required in order to implement the plan? • Is it clear who will have responsibility for delivery of each communication channel? • Do you have sufficient staff to deliver this strategy or will outside resources be required? • What funding is already in place?

TABLE 1. GUIDING QUESTIONS FOR DRAFTING A STAKEHOLDER ENGAGEMENT STRATEGY (cont.)

Strategy components	Guiding questions
Tools, methods and approaches	
Provide general information on the communication channels and tools to be used in order to deliver messages to relevant stakeholders.	• What channels will you use to communicate the messages to the target audience? • Do the selected channels pose any challenges to staff in terms of creation? • Do the selected channels pose any challenges to stakeholders in terms of accessibility?
Evaluation criteria and follow-up process	
Describe how the effectiveness of the implementation of the stakeholder engagement strategy will be evaluated, measured and adapted (e.g. through public opinion surveys, media and social media monitoring, etc.).	• Who will be responsible for developing the review criteria and making the review happen? • What methods will you use to decide whether each communication approach is effective?
References	
List any and all documents that can provide necessary background and technical information.	• What are the relevant reference documents for the strategy?
Abbreviations	
Define any and all abbreviations used in the strategy.	• What abbreviations are used in the strategy and are be included as a reference for clarity to readers?
Distribution list	
Distribute the strategy to all individuals and organizations responsible for and/or participating in stakeholder engagement.	• Who needs to receive this strategy in order to carry out their work?

Appendix II

STAKEHOLDER PRIORITIZATION METHODOLOGY

The possible impacts of a programme will not be the same for everyone. Different groups of stakeholders will have different levels of interests and concerns. Some stakeholders will be more influential than others. The prioritization process can be a complex exercise and requires the input of various departments including those responsible for the financial, environmental and social impact programmes within the organization.

II.1. SUMMATIVE SCALE

Experience shows that prioritizing the identified stakeholders is useful for the decision making process and for setting a strategy that addresses key audiences. Below is a methodology that is based on the triple bottom line concept. Triple bottom line (also known as TBL or 3BL) "is a business concept that posits firms should commit to measuring their social and environmental impact — in addition to their financial performance — rather than solely focusing on generating profit, or the standard "bottom line." It can be broken down into "three Ps": profit, people, and the planet [30]." The triple bottom line concept may be used by organizations to more holistically evaluate performance and generate more business value. This methodology includes the participation of the entire organization, not only the communication team.

This is a real tool developed under the leadership of a stakeholder engagement and communication expert at an owner/operator organization. It allows groups to be prioritized according to the objectives of the organization and impact of the programme on those stakeholders.

In this scaling method there is a list of criteria that covers a broad spectrum of stakeholder engagement issues. Each criterion has a weighting factor, ranked by the team relative to the other criteria on the list:

— *Dependence on the product or service*: How much does the stakeholder depend on the product that is provided, such as electricity generation?
— *Geographic proximity*: If a nuclear facility is anticipated or in place, how far or close is the stakeholder to the facility?
— *Impact on social responsibility*: How much can the stakeholder be impacted by the social responsibility programme of the organization?

— *Impact on the product or the service*: How much impact can the stakeholder have on the product or service of the organization?
— *Impact on public opinion*: How much impact can the stakeholder have on the public opinion in terms of their statements or activities?
— *Impact on the internal culture*: How much impact can the stakeholder have on the internal culture of the organization?
— *Political impact*: How much impact can the stakeholder have on the politics of the organization?
— *Economic impact*: How much impact can the stakeholder have on the finances of the organization?
— *Reputation impact*: How much impact can the stakeholder have on the reputation of the organization?

Each organization can add more criteria depending on its own characteristics, such as level of education, possibility of rumours, etc.

Finally, this methodology presents some criteria that refer directly to the characteristics of every stakeholder on a scale from one to three, where one is the lowest and three is the highest:

— *Credibility*: How credible is information from the stakeholder perceived to be?
— *Power*: How powerful is the stakeholder in terms of influencing the organization?
— *Urgency*: How urgent are the needs, complaints or requirements presented by the stakeholder?

II.2. GIVING VALUE TO EACH CRITERION

One of the most important parts of the methodology is the participation and discussion within the organization to agree on the values for each criterion. These criteria can change depending on the characteristics of the organization, but the interdisciplinary work is key, because different areas provide different points of view. The responsible team rates each stakeholder group against every item on a scale from one to five, where one is the lowest and five is the highest.

The result of this task will be a value for each stakeholder group that sets the prioritization order for delivering programmes and activities, as illustrated in Fig. 4. Each organization can use this methodology with as many stakeholders as desired.

Table 2 is an example chart that presents three different stakeholders: local community, national media and universities. In this case, all of them are

key but not necessarily of equal priority. The result will vary depending on the organization and the social, economic and environmental impacts.

FIG. 4. Results from the example stakeholder prioritization exercise in Table 2.

TABLE 2. SAMPLE VALUES AND PRIORITIZATION METHODOLOGY FOR STAKEHOLDER GROUPS

Criteria[a]	Weighting factors[b]	Local community		National media		Universities	
		Value[c]	Factor × value	Value	Factor × value	Value	Factor × value
Dependency on the product	0.15	5	0.75	3	0.45	2	0.3
Geographical proximity	0.12	5	0.6	1	0.12	1	0.12
Impact on social responsibility	0.11	5	0.55	2	0.22	1	0.11
Impact on the product and the service	0.1	3	0.3	3	0.3	1	0.1
Impact on public opinion	0.12	5	0.6	5	0.6	4	0.48
Impact on the internal culture	0.09	3	0.27	4	0.36	1	0.09
Political impact	0.09	4	0.36	5	0.45	3	0.27
Economic impact	0.1	2	0.2	3	0.3	1	0.1
Reputation impact	0.12	5	0.6	5	0.6	4	0.48
Total weighted interest per stakeholder group	1		4.23		3.4		2.05

TABLE 2. SAMPLE VALUES AND PRIORITIZATION METHODOLOGY FOR STAKEHOLDER GROUPS (cont.)

Criteria[a]	Weighting factors[b]	Local community		National media		Universities	
		Value[c]	Factor × value	Value	Factor × value	Value	Factor × value
Prioritization criteria[d]							
Credibility			3		2		3
Power			3		3		2
Urgency			3		2		1
Average of prioritization criteria			3		2.33		2
Prioritization result[e]			12.69		7.93		4.1

[a] These are sample criteria; organizations need to first determine whether these or other criteria will impact successful outcomes of the programme or project.

[b] Weighting of the criteria is to be completed in such a way that the total equals 1, with the weight of each criterion being relative to the others on the list.

[c] Value of each stakeholder group against each criterion is rated on a scale of 1 to 5, with 5 being the greatest.

[d] Prioritization on a scale of 1 to 3, with 3 being the highest.

[e] Total weighted interest per stakeholder group × average of prioritization criteria.

Appendix III

OPINION RESEARCH

Opinion research can provide information necessary to productively engage with stakeholders, including:

— Who are the stakeholders?
— What does the public really think about nuclear energy and why?
— How well informed are the different stakeholders about nuclear energy topics?
— How do they picture nuclear energy in the energy mix?
— Can increasing awareness of the advantages of nuclear energy make stakeholders more receptive to new nuclear energy?
— Can you convey safety through technology innovation advanced safety systems?
— What kinds of spokespersons are most credible to these stakeholders?
— If there is an existing plant, can plant neighbours be your best advocates? If there is no existing plant, would stakeholders be interested in talking with neighbours of a plant somewhere else?

Useful methods for gathering information on public opinion include:

— Surveys (cell phone, landline, on-line);
— Focus group discussions;
— One-on-one interviews with leaders;
— Coordinated two-way communication between identified and trained employees and key audiences.

Choosing the best method for doing public opinion research depends on what you want to learn, from which audiences, and with what budget.

III.1. SURVEYS

Surveys can reveal useful information including:

— Attitudes about your topic;
— Knowledge about your topic;
— Messages that are most persuasive;

— Values: what the audience cares about;
— Opinions about your organization, community leaders, others;
— Sources of information, how to reach your audience;
— Credible spokespersons;
— Opinions about terms (identify jargon to avoid), slogans, logos, ads, and other materials;
— Demographic differences;
— Changes over time.

Important considerations in survey decisions are:

— What are the objectives? How will the survey results be used?
— What is the budget?
— What audiences are to be surveyed?
— What sample size is needed?
— Are they best conducted by cell phone, landline, on-line, or in person?
— What questions need to be asked?
— Are open-ended questions necessary? They are more expensive but help with understanding what is most important to the respondents and their level of knowledge of your topics;
— How can bias be avoided?
— What other surveys can be used as benchmarks?
— What is needed to track opinions over time?

Survey questions need to be short, simple, clear, and contain words that everyone can understand. To avoid bias, consider how each question influences the next one. Key attitude questions have to be placed before questions that give information that might be new to the respondent.

III.2. FOCUS GROUPS

Focus groups are a tool to gauge what people are thinking and why. A moderator uses a list of questions to guide a small group discussion (between 8 and 12 people at one time). While focus groups are qualitative and not quantitative, it is useful to hear the language people use when they discuss topics. Focus groups may be expensive, but they can also save money by revealing unanticipated concerns or the most effective language which enables of messages and materials to be modified before they are tested and used in a broader survey.

Start with general questions to gauge knowledge and opinions on the topic. To test messages, you may show draft or finished materials and ask for

participants to underline or circle parts that are especially good points to make and put an X next to points that are not clear or not convincing. Then ask for a discussion of these points. Another approach is to put messages on cards and ask for participants to rank the cards from the one containing the best points to the one containing the least good points (namely, 'good' for making the case that is the objective, such as choosing nuclear power as one of the ways to supply electricity in this country). The group could then be asked to discuss each card's strong and weak points. The group could conclude with discussions of attitude changes, reasons for these changes, and opinions about sources and methods of sharing information on the topic.

III.3. EXECUTIVE INTERVIEWS

Interviews with key leaders can provide important insights that may be useful to guide communication and priorities. The interviews may be conducted in person or by phone. Prepare a set of questions or topics for the interviewer who can then follow the conversation where it leads while covering all the questions or topics. Findings and observations for each interview and for the group need to be compiled in a report.

III.4. TWO-WAY COMMUNICATION WITH KEY AUDIENCES

An important method for understanding the opinions of stakeholders is to develop a network of people in key audiences who have relationships with people from your organization. First, identify a coordinator and a point of coordination within your organization. Next, identify people in your organization who interact with key audiences. Develop a systematic method of using those people to transmit information to the assigned stakeholders and to report back to the coordinator any opinions and concerns. The coordinator assembles the feedback for the benefit of the organization and for serving customers well.

Appendix IV

PUBLIC INFORMATION CENTRES

Public information centres provide an opportunity to educate and inform stakeholders. The centres may also be used to engage and attract students to consider working in the field of nuclear science and technology. Information centres need to be welcoming places for regular tours by schoolchildren, community organizations, local residents, and other stakeholders.

When designing an information centre, some considerations include:

— For security reasons, it needs to be located outside the secure area of a plant;
— Ease of access will encourage its use by large numbers of people;
— Multi-use information centres are more cost-effective and might facilitate public uses such as educational programmes, community meetings, information sessions, and press conferences to expand their reach and usefulness;
— Displays need to be interactive and colourful;
— Displays need to be engaging for middle school aged children as well as intellectually stimulating for adults;
— Displays need to be easy to update so that information remains current without too much time and expense;
— Displays need to be durable.

Information that might typically be included in information centres:

— An explanation of electricity;
— How energy is generated;
— The energy mix, including alternative and renewable energy and the role of nuclear power;
— A virtual tour of a plant or model of a nuclear reactor;
— How a nuclear power plant works, including contemporary information on how long it operates;
— The history of electricity;
— The history of nuclear power;
— An explanation of electricity transmission and distribution;
— The advantages of nuclear energy;
— Safety features and safety records of nuclear power plants;
— How spent nuclear fuel is stored and managed;

— An explanation of radiation and how various materials can reduce exposure to radiation;
— The benefits of radiation in medicine, food safety, and space exploration;
— An explanation of the water plume that is emitted from some cooling towers;
— A display about nuclear energy plants worldwide.

IV.1. EVALUATION

Public information centres such as energy education centres have proven effective in building support for nuclear power. Surveys, such as that shown in Fig. 5, have shown that a majority of nuclear power plant neighbours who had visited an energy education centre said that the visit made them more favourable to nuclear power.

A 2015 survey by Bisconti Research, Inc. found that 36 per cent of US nuclear power plant neighbours said they had visited an energy education centre. Of those who visited, 66 per cent said the visit made them more favourable to nuclear energy (see Fig. 5).

IV.2. QUESTION POSED

Figure 5 shows the result of asking those who had visited an energy education centre: "Did that visit give you a *more favourable* impression of nuclear energy than you had before, a *less favourable* impression, or *did it not make any difference*?"

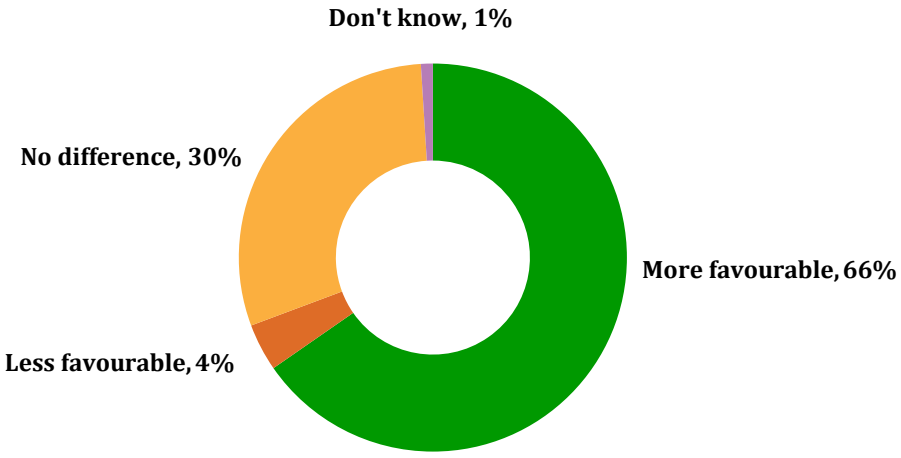


FIG. 5. Results of a 2015 survey by Bisconti Research, Inc. of the impact of a visit to an energy education centre showed that of the 36% of nuclear power plant neighbours in the United States of America who visited an education centre, 66% became more favourable about nuclear energy. Therefore 24% of all those plant neighbours became more favourable to nuclear energy as a result of visiting an energy education centre.

Appendix V

SOCIAL MEDIA STRATEGY

V.1. INTRODUCTION

Social media is the term for digital platforms that allow users to interact by publishing, receiving and engaging with content shared through public-facing on-line networks. There are many digital services and platforms that include an aspect of social media — from discussion forums to product reviews. While the features of the social media landscape change constantly, the following fundamental characteristics will likely remain in the longer term:

— *Low barriers to entry*: Public platforms are free of charge and require only consumer technology.
— *One-click broadcast or self-publishing*: This supports ease of use and results in potentially very fast-paced conversation.
— *Interaction*: Users respond publicly or directly to the content published by others, for example to comment, share or signal a positive or negative response.
— *Continuity*: Social media platforms are ongoing conversations without an end point.

There is a wide range of technology options:

— Social media platforms evolve in a symbiotic relationship with trends in content and technology, especially relating to mobile devices. Some platforms have a high level of integration with one or more forms of digital content, such as images, audio, video or external web sites. Some integrate with sources of data such as location, physical activity or third-party apps;
— Proprietary algorithms tailor each platform's content for each user, promoting content that has proven popular outside the user's network as well as targeted content such as advertisements.

Closely related to social media are messaging apps and collaboration/community apps, which share most of the same features but with more private levels of visibility. For this publication, we consider only the mainstream public platforms.

V.2. RELEVANCE

Social media is used by a majority of individuals globally, though modes of use vary greatly by region, age group and type of content. Some social media platforms are popular source of public information and commentary on news and current affairs. The familiar context and peer sharing nature of social media means information and ideas may be received there with a higher level of trust compared to through traditional media. Planning for crisis communication and emergency preparedness and response needs to include your organization's use of social media and consideration of how others would use it.

If a stakeholder is defined as anyone who feels physically or emotionally affected by a project or facility, then social media users include the full range: from individuals to civil society groups, government departments, politicians, media and industry partners as well as staff members. Social media therefore is an effective tool to disseminate information, to engage directly with stakeholders and to build trust by communicating in a fully transparent manner that is open to public view. An effective social media strategy can support the key principles of stakeholder engagement (Section 2).

V.3. OBJECTIVES

Social media is a tool; using it is not an end in itself. Unplanned use of social media can be time consuming, ineffective and even damaging to an organization's reputation, so it is important to plan according to an up-to-date stakeholder engagement strategy, including specific and measurable objectives for a social media presence. Social media platforms offer detailed analytics on your reach and interaction as well as paid promotion and targeting services that can help you reach specific stakeholder groups. Metrics need to be monitored with regular reporting on progress towards objectives.

V.4. PLATFORM/TACTICS

The behaviour of stakeholder groups will vary across different social media platforms. It can be useful to select platforms where the most important stakeholders are active and which are conducive to the desired level of interaction with them.

Table 3 is an example of how to select which platforms to use, list each social media platform being considered, and list audience and tactics or activities in sharing content for each one.

TABLE 3. GUIDING QUESTIONS FOR DRAFTING A STAKEHOLDER ENGAGEMENT STRATEGY

Platform name	E.g. Facebook, Twitter, LinkedIn, Weixin/WeChat, TikTok
Audience	Each stakeholder group, or subset, which is active on that platform (e.g. individuals living within 30 kilometres of your facility)
Objective	What you want to achieve by communicating with them? (e.g. raise awareness and increase participation in local consultation)
Content	What will your posts consist of? (e.g. announcements, links to documents, links to registration pages; images and video clips from previous consultations)
Frequency	How often will you post? (e.g. once a day in the lead up to a consultation, twice a week during a comment period)
Tactics	The tone of voice and style of engagement (e.g. warm tone of voice, encouraging, a listening attitude, helpful in answering logistical questions)
Measure of success	A real-life result or a digital metric (e.g. increase written responses by 20%, increase attendance at public meetings by 10%, achieve 100 000 views of an announcement or document)

The instant feedback of social media means tactics can be revised according to experience and learning from metrics.

V.5. CONSIDERATIONS

Social media environments are live and constantly changing, so success depends on adapting to context. Balance is required to communicate serious subject matter in a familiar medium and tactics that work on one platform may not be effective or suitable on another.

If your strategy involves responding to public conversation and trending topics, then a reliable process for rapid approval of posts and replies to comments needs to be developed.

Strategy and tactics have to consider the extent to which you choose to interact and are willing to respond to interaction. For example:

— Will your branded accounts respond to posts by other stakeholders?
— Will you answer questions posed directly by the public?
— At what point would you consider an engagement to have been made in bad faith and stop responding?

Most staff members are social media users in their own right and consideration needs to be given to the extent that their self-directed communication supports overall communication goals. Some staff, such as senior officials, spokespersons, subject matter experts or community ambassadors, may have established high levels of respect and trust and be influential among stakeholders. Communication by such staff members can complement that by branded accounts, but communication experts need to provide guidance or coaching to ensure effectiveness and alignment with the strategy's principles. Staff at all levels benefit from basic guidelines on the use of social media that complement clear policies in an organization's staff handbook or code of conduct.

Where staff members interact with the public on social media there is potential for them to be victims of on-line abuse. Staff need to be guided and supported to protect themselves using the tools that platforms provide and be empowered to step back if they choose to.

V.6. CONTENT DEVELOPMENT

Reaching a wide audience or penetrating a stakeholder group requires posts that stakeholders will engage with. While meeting communication objectives, posts need to be appealing enough to keep stakeholder attention and ideally inspire them to engage and share further. The familiar context of social media makes entertaining and intriguing content popular. Examples include:

— General topics:
    - Information about the organization, its people, technology and processes;
    - Announcements such as contracts, press releases or project milestones;
    - Information on the organization's purpose;
    - Insights into ongoing projects such as consultation, capacity building, construction and decommissioning.
— Stakeholder targeted topics:
    - Speaking to stakeholder interests and values;

    - The benefits and risks of the organization's work to them;
    - Activities that exemplify related organizational values.
- Topical matters:
    - Resharing relevant posts from other organizations;
    - Reactions to national and international events.

Social media channels need to be kept active with regular posts, and potentially ads, based on a calendar of activities with scope to respond to public conversation, news and trending topics.

V.7. EXAMPLES OF PROPOSED SERVICE STANDARDS

The example in Table 4 elaborates a process under which social media content can be approved and published in a timely manner by a communication team within a large organization.

Requests to the communication team generally fall within two categories:

- *Regular requests*: These constitute any project, conference or communication product that has been developed within an organization. Requests of this nature need to be received to the social media inbox ideally a minimum of eight business days before desired posting date;
- *Trending topic request*: These constitute any current themes or topics to which the organization can contribute.

Communication teams need to also be ready for requests based on any interaction that has taken place on any given channel, for example comments or questions.

Note: sending a request would not guarantee that a post would be included or scheduled. Strategic review by communication experts is required to determine if the content provided aligns with the goals of the channel, meets the communication objectives of the organization and is relevant and appropriate to the particular communication environment.

TABLE 4. SCHEDULING OF SOCIAL MEDIA POSTS

Steps	Action	Service standards	
		Regular request	Trending topics [a]
Initial request and draft(s)	Social media officer assesses the request and drafts post(s) accordingly	1–2 business days	Same day
Revision of draft request	Social media officer and relevant communication officer revise posts as needed	1–2 business days	Same day
Final posts reviewed by relevant internal/ external counterpart(s)	Internal/external counterpart(s) review and approve posts	1 business day	Same day
Final approval by responsible manager	Responsible manager approves	1 business day	Same day
Translation/revision	Final posts sent to translation team	1–2 business days	Social media officer does initial translation and sends for revision
Post on social media	Social media officer posts on date specified	n.a	n.a.

[a] Trending topic requests will be processed and posted in one day when possible.
[n.a.] not applicable.

REFERENCES

[1] HORE-LACY, I., Reclaiming Some Moral High Ground — Ethical Aspects in Nuclear Communications, 12th Int Workshop on Nuclear Public Information in Practice, Ljubljana, Slovenia (13–16 Feb 2000).

[2] INTERNATIONAL ATOMIC ENERGY AGENCY, Stakeholder Involvement Throughout the Life Cycle of Nuclear Facilities, IAEA Nuclear Energy Series No. NG-T-1.4, IAEA, Vienna (2011).

[3] GRIMSTON, M., Back on the agenda, CMERA9, **796** (2007) 27–29.

[4] INTERNATIONAL ATOMIC ENERGY AGENCY, Milestones in the Development of a National Infrastructure for IAEA Nuclear Power, IAEA Nuclear Energy Series No. NG-G-3.1 (Rev. 1), IAEA, Vienna (2015).

[5] INTERNATIONAL ATOMIC ENERGY AGENCY, An Overview of Stakeholder Involvement in Decommissioning, IAEA Nuclear Energy Series No. NW-T-2.5, IAEA, Vienna (2009).

[6] INTERNATIONAL ATOMIC ENERGY AGENCY, Communication and Stakeholder Involvement in Environmental Remediation Projects, IAEA Nuclear Energy Series No. NW-T-3.5, IAEA, Vienna (2014).

[7] INTERNATIONAL ATOMIC ENERGY AGENCY, Communication with the Public in a Nuclear or Radiological Emergency, IAEA, Vienna (2012).

[8] INTERNATIONAL ATOMIC ENERGY AGENCY, Leadership and Management for Safety, IAEA Safety Standards Series No. GSR Part 2, IAEA, Vienna (2016).

[9] NUCLEAR ENERGY INSTITUTE, Materials Initiative Communications Plan, NEI, Washington, DC (2005).

[10] NUCLEAR ENERGY INSTITUTE, NEI's Community Relations Principles for Members, NEI, Washington, DC (undated).

[11] NUCLEAR REGULATORY COMMISSION, Report of the Public Communication Task Force, NRC, Washington, DC (2003).

[12] INTERNATIONAL ASSOCIATION FOR PUBLIC PARTICIPATION, Public Participation Toolbox (2006), https://icma.org/sites/default/files/305431_IAP2%20Public%20Participation%20Toolbox.pdf

[13] INTERNATIONAL ATOMIC ENERGY AGENCY, Nuclear Communications: A Handbook for Guiding Good Communication Practices at Nuclear Fuel Cycle Facilities, IAEA, Vienna (1994).

[14] OECD NUCLEAR ENERGY AGENCY, Stakeholder Involvement Techniques: A Short Guide and Annotated Bibliography, NEA/RWM/FSC (2004)7, OECD/NEA, Paris (2004).

[15] INTERNATIONAL NUCLEAR SAFETY GROUP, Stakeholder Involvement in Nuclear Issues, INSAG-20, IAEA, Vienna (2006).

[16] RICHARDSON, P.J., A Review of Benefits Offered to Volunteer Communities for Siting Nuclear Waste Facilities. Swedish National Co-ordinator for Nuclear Waste Disposal (M 1996:C), Stockholm (1998).

[17] ENVIRONMENTAL COUNCIL, Best Practice Guidelines on Public Engagement for the Waste Sector (2003).
[18] NUCLEAR REGULATORY COMMISSION, Public Involvement Meeting Minutes, 22 July 2003, NRC, Washington, DC (2003).
[19] INTERNATIONAL ATOMIC ENERGY AGENCY, Building a National Position for a New Nuclear Power Programme, IAEA Nuclear Energy Series No. NG-T-3.14, IAEA, Vienna (2016).
[20] INTERNATIONAL ATOMIC ENERGY AGENCY, Responsibilities and Functions of a Nuclear Energy Programme Implementing Organization, IAEA Nuclear Energy Series No. NG-T-3.6 (Rev. 1), IAEA, Vienna (2019).
[21] INTERNATIONAL ATOMIC ENERGY AGENCY, Governmental, Legal and Regulatory Framework for Safety, IAEA Safety Standards Series No. GSR Part 1 (Rev. 1), IAEA, Vienna (2016).
[22] INTERNATIONAL ATOMIC ENERGY AGENCY, Strategic Environmental Assessment for Nuclear Power Programmes: Guidelines, IAEA Nuclear Energy Series No. NG-T-3.17, IAEA, Vienna (2018).
[23] INTERNATIONAL ATOMIC ENERGY AGENCY, Factors Affecting Public and Political Acceptance for the Implementation of Geological Disposal, IAEA-TECDOC-1566, IAEA, Vienna (2007).
[24] THE PERRYMAN GROUP, The Impact of Exelon's Proposed Construction and Operation of a Nuclear Power Facility on Business Activity in Victoria County and Texas, Texas, July 2008.
[25] NUCLEAR ENERGY INSTITUTE, Economic Benefits of Diablo Canyon Power Plant, An Economic Impact Study by the Nuclear Energy Institute in cooperation with Pacific Gas & Electric Company, NEI, Washington, DC (2004).
[26] RICHARDSON, P.J., "Basic requirements for successful public involvement in siting contentious facilities" (Proc. 8th Int. Conf. on High Level Waste Management, Las Vegas, 11–14 May 1998), 846.
[27] TAKUBO, M., Wake up, stop dreaming: Reassessing Japan's reprocessing program, The Nonproliferation Review, **15** 1 (2008) 71–94.
[28] KOREA HYDRO & NUCLEAR POWER CO., LTD., Presentation — Community Friendly Management of KHNP (2006).
[29] OECD NUCLEAR ENERGY AGENCY, Stakeholder Involvement in Decommissioning Nuclear Facilities, NEA No. 6320, OECD, Paris (2007).
[30] HARVARD BUSINESS SCHOOL ONLINE (2020), https://online.hbs.edu/blog/post/what-is-the-triple-bottom-line

CONTRIBUTORS TO DRAFTING AND REVIEW

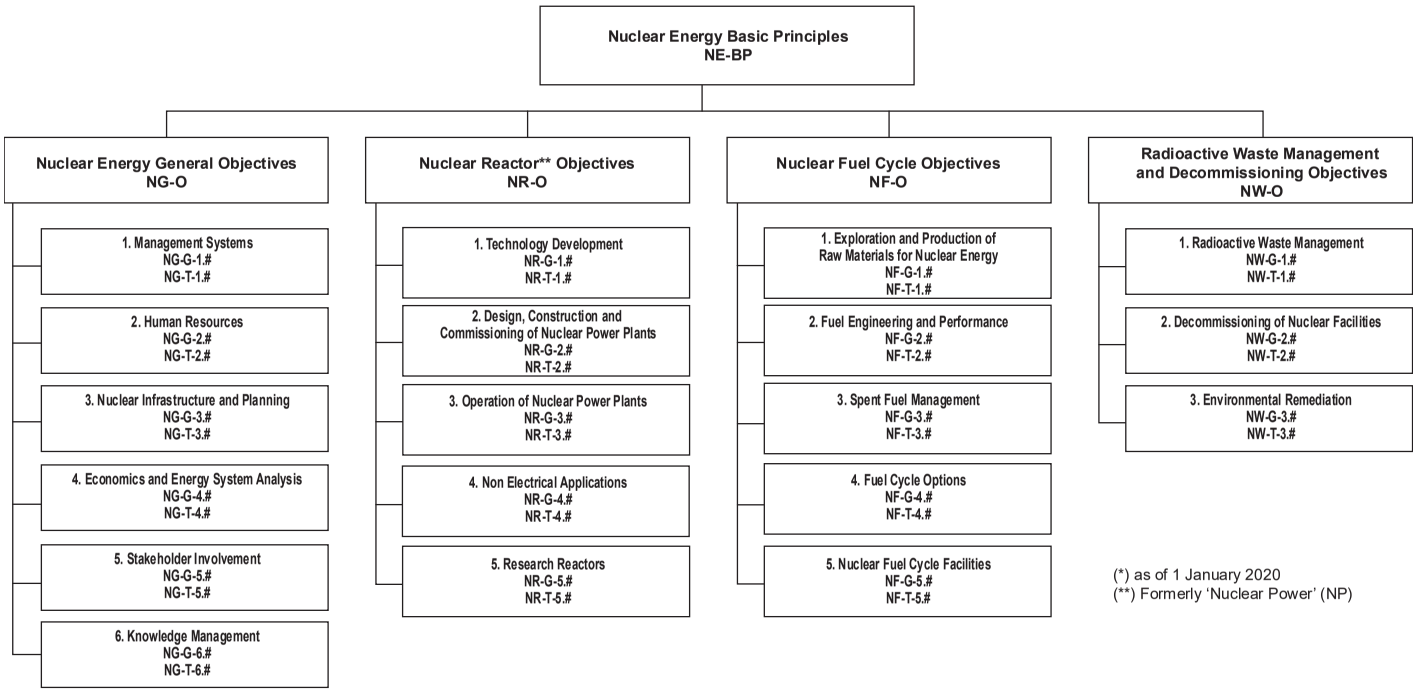
Agbodemegbe, V.	Ghana Atomic Energy Commission (GAEC), Ghana
Algudan, R.	Jordan Atomic Energy Commission (JAEC), Jordan
Ali, A.	Egyptian Atomic Energy Authority (EAEA), Egypt
Asamoah, M.	Nuclear Regulatory Authority, Ghana
Barfield, K.	Consultant, United States of America
Bastos, J.	International Atomic Energy Agency
Berthelot, L.	International Atomic Energy Agency
Bisconti, A.	Bisconti Research, Inc., United States of America
Boardman, J.	Nigeria Atomic Energy Commission (NAEC), Nigeria
Dagenais, S.	Canadian Nuclear Safety Commission (CNSC), Canada
Daifuku, K.	International Institute of Nuclear Energy, France
Danilenka, N.	Gosatomnadzor, Belarus
Davydova, M.	Environmental Projects Consulting Institute, Russian Federation
Drury, D.	International Atomic Energy Agency
Farias, A.	Consultant, Argentina
Gordon, J.	Fluent in Energy, United Kingdom
Jubin, J.R.	International Atomic Energy Agency
Lång, O.	STUK, Finland
Li, X.	China National Nuclear Power Company Ltd, China
Makgae, L.	Department of Energy, South Africa
Margavyan, A.	ARMATOM Institute, Armenia
Mayer, S.	International Atomic Energy Agency

Omisore, T.	Nigeria Atomic Energy Commission (NAEC), Nigeria
Paillere, H.	International Atomic Energy Agency
Prasertwiagai, P.	Electricity Generating Authority, Thailand
Razali, M.	Consultant, Malaysia
Shumski, V.	Ministry of Foreign Affairs, Belarus
Tachibana, M.	International Atomic Energy Agency
Tarren, P.	International Atomic Energy Agency
Thu Giang, N.	Vietnam Atomic Energy Agency (VAEA), Viet Nam
Van Heek, A.	International Atomic Energy Agency
Vasily, G.	ASE Joint Stock Engineering Company, Russian Federation

Technical Meeting

Vienna, Austria: 3–6 September 2018

Structure of the IAEA Nuclear Energy Series*



(*) as of 1 January 2020
(**) Formerly 'Nuclear Power' (NP)

Key

BP: Basic Principles
O: Objectives
G: Guides and Methodologies
T: Technical Reports
Nos 1–6: Topic designations
#: Guide or Report number

Examples

NG-G-3.1: Nuclear Energy General (**NG**), Guides and Methodologies (**G**), Nuclear Infrastructure and Planning (topic **3**), **#1**

NR-T-5.4: Nuclear Reactors (**NR**)*, Technical Report (**T**), Research Reactors (topic **5**), **#4**

NF-T-3.6: Nuclear Fuel (**NF**), Technical Report (**T**), Spent Fuel Management (topic **3**), **#6**

NW-G-1.1: Radioactive Waste Management and Decommissioning (**NW**), Guides and Methodologies (**G**), Radioactive Waste Management (topic **1**) **#1**

IAEA
International Atomic Energy Agency

No. 26

ORDERING LOCALLY

IAEA priced publications may be purchased from the sources listed below or from major local booksellers.

Orders for unpriced publications should be made directly to the IAEA. The contact details are given at the end of this list.

NORTH AMERICA

Bernan / Rowman & Littlefield
15250 NBN Way, Blue Ridge Summit, PA 17214, USA
Telephone: +1 800 462 6420 • Fax: +1 800 338 4550
Email: orders@rowman.com • Web site: www.rowman.com/bernan

REST OF WORLD

Please contact your preferred local supplier, or our lead distributor:

Eurospan Group
Gray's Inn House
127 Clerkenwell Road
London EC1R 5DB
United Kingdom

Trade orders and enquiries:
Telephone: +44 (0)176 760 4972 • Fax: +44 (0)176 760 1640
Email: eurospan@turpin-distribution.com

Individual orders:
www.eurospanbookstore.com/iaea

For further information:
Telephone: +44 (0)207 240 0856 • Fax: +44 (0)207 379 0609
Email: info@eurospangroup.com • Web site: www.eurospangroup.com

Orders for both priced and unpriced publications may be addressed directly to:

Marketing and Sales Unit
International Atomic Energy Agency
Vienna International Centre, PO Box 100, 1400 Vienna, Austria
Telephone: +43 1 2600 22529 or 22530 • Fax: +43 1 26007 22529
Email: sales.publications@iaea.org • Web site: www.iaea.org/publications

INTERNATIONAL ATOMIC ENERGY AGENCY
VIENNA