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As part of its Stewardship commitment the Namibian Uranium Association (NUA) created and supports the Namibian Uranium Institute (NUI). The main purpose of the NUI is to act as a communication and training hub for the uranium industry in Namibia. It promotes learning and capacity building in specialized skills in the fields of health, environmental management and radiation safety/security; thereby improving safety, environmental and health performance through identifying leading practices and facilitating their adoption.

By combining the NUI’s independence and resources, the NUI creates something unique in the field of preventative science. Through the NUI, the uranium mining and exploration fraternity works closely with other stakeholders, in particular with the Ministry of Mines and Energy and the Ministry of Environment and Tourism to ensure the sustainable development of Namibia’s uranium resources. In accordance with its mission, the NUI also engages with all stakeholders such as the public, visitors and scientists from around the world. It assists individual members of the exploration and mining fraternity in complying with regulations through education, consultation and compliance monitoring.

Concern has often been expressed over whether or not radiation exposure to uranium mining workers resulted in an increased risk of cancer. The NUI supports independent medical evaluation of employees and ex-employees as part of its commitment to implement leading practice standards, thereby protecting and promoting the health of both employees and the environment. In 2011, Rössing began preparing for an independent study designed to stand up to scientific scrutiny. A scoping study was awarded to an independent consulting company, SENES, based in the Netherlands, in March 2013. The scoping study was completed in August 2014. The project was awarded to the reputable Centres for Occupational & Environmental Health (Epidemiology) and to the Biostatistics Institute of Population Health, Faculty of Medical and Human Sciences at the University of Manchester in August 2015. The project completion is expected towards the end of 2017.

At the recent COP21 (21st Conference of the Parties to the United Nations Framework Convention on Climate Change), which took place in France in December 2015, intense discussion centred on delivering a new universal climate change agreement leading to a low-carbon, sustainable future that keeps a global temperature rise under 2 degrees Celsius. Most academics were of the opinion that a combined strategy employing all the major sustainable clean energy options should be considered – including renewables and nuclear power. The nuclear industry and uranium mining evokes strong opposing views. The uranium industry respects the views of all stakeholders and knows that we will always grapple with the question whether uranium mining is in the best interest of our country. Only history will provide the answer. The NUI does, however, undertake to always remind all that a preventative and sustainable strategy invariably succeeds best. The exploration and mining community must at all times treat the environment and the health of the people with respect. The NUI will support the uranium industry to achieve its objectives through transparent consultation; evidence based teaching; and continuous improvement.

The NUA has named Dr Gabi Schneider as the new Executive Director of the NUI who will take over on the 1st of February 2016. The Board was looking for a visionary leader and found Dr Schneider who will bring a wealth of environmental and sustainable development leadership to the position. She has proven herself to be an effective manager with an unwavering commitment to expand all available sustainable opportunities. She will lead the NUI to greater heights and has my full support.

I thank all stakeholders for their support and guidance over many years.

Dr. Wotan Swiegers
Executive Director, Namibian Uranium Institute (NUI)
Uranium mining remains a controversial subject, principally because of its legacy regarding environmental and health issues created during the early phase of the industry. However, uranium mining and milling has evolved significantly over the years and can and should be mined in a way that protects workers, the public and the environment. Today, uranium mining is conducted in Namibia under significantly different circumstances than in the past and is now the most regulated and one of the safest forms of mining in the world. In this regard the NUI has, and continues to play, a significant role.

The modern method of mining uranium, with proper risk analysis combined with strictly enforced regulatory standards, is the only acceptable way forward.

In the same report the NEA recommends:

- Governments, industry, regulatory agencies and the public should work together effectively to make sure that leading practice uranium mining becomes normal practice in order to leave a positive legacy for future generations.
- For countries currently producing uranium, the life cycle framework to manage health and environmental impacts described in this report should be taken into consideration when evaluating the effectiveness of existing frameworks.
- Uranium producers should be open and transparent about their operations in order to provide the information necessary to evaluate practices.
- Those purchasing uranium should ensure that uranium is preferentially purchased from producers using leading practices outlined in this report.

provide assurance that uranium mining is conducted in a safe and environmentally responsible manner. In many ways Namibia is already an excellent example on how to implement and continuously improve the key components for achieving the following goals:

- establishing the appropriate regulatory framework
- planning for closure before the mine begins production
- requiring companies to post financial assurance to cover the costs of remediation
- applying leading practices to minimise the radiation exposure of workers and the local population, protect water resources and safely manage and dispose of tailings and problematic waste rock
- instituting a programme of public consultation and information sharing, beginning with an effective and all-encompassing environmental impact assessment process
- Conducting effective environmental monitoring programmes throughout the life of the mine facility.

The modern method of mining uranium, with proper risk analysis combined with strictly enforced regulatory standards, is the only acceptable way forward.
The Namibian Uranium Association (NUA)’s members engaged in uranium mining and processing, recognized that managing radiation, health and safety, waste and the environment, was of paramount importance for the protection of workers, the public and the environment. Responsible management of uranium mining and processing projects applies at all stages: from planning to exploration through development, construction and operations, and on to decommissioning.

The genesis of the Namibian Uranium Institute (NUI) stemmed also from the uranium industry’s realization that the uncontrolled and uncoordinated “uranium exploration rush” from 2007 onwards posed a significant risk to the industry itself. The NUI was thus originally set up in an environment with little regulation relating to the uranium industry, forcing it to focus heavily on the need for regulation. The NUI has successfully initiated many well-coordinated projects around Safety, Health, Environment, Radiation and Quality (SHERQ) and assisted with the creation of recommendations on legislation. Through the NUI, the uranium mining and exploration fraternity works closely with the Government and state agencies to ensure the sustainable development of Namibia’s uranium resources.

At present the situation is changing. Whilst the NUI continues to focus on specialized skills in the fields of health, environmental management and radiation safety, it has had to align itself with the Government’s vision in terms of national training and occupational health service delivery. Close academic ties had to be developed with the Namibia University for Science and Technology and the Government’s Namibia Energy Institute. This process is ongoing.

Currently, the NUI is financially supported by the NUA and tasked to promote a positive, responsible, integrated safety and preventative culture at all levels amongst the NUA community. It assists individual members in complying with regulations and mandates. The NUI accomplishes its role of regulatory liaison through education, consultation, and compliance monitoring.

- The NUI supports individual companies with advice and training on environmental, health and safety issues and actively promotes integrating these issues into the business plan and day-to-day operations of the company.
- The NUI supports HSE departmental efforts to recognize, evaluate and control hazards, and integrate environmental, health and safety considerations into their daily operations and planning, by imparting knowledge and affirming roles and responsibilities.
- The NUI supports employees’ efforts to maintain a safe and healthy workplace by providing training, information, consultation, and effective feedback in a courteous, ethical, professional and timely manner.
- The NUI provides necessary services to the community to monitor and ensure a safe and healthy living, learning and working environment.
- The NUI also supports universal compliance by coordinating that certain regulatory-required reports are submitted to the Government and authorities.
3 SHERQ Training

a) Regular training in Safety, Health, Environment, Risk and Quality (list appended as an annexure)
   • Safety training for members in association with NOSA
   • Radiation Safety Training for Radiation Technicians, Radiation Safety Officers, Radiographers and for Personnel working with Radiation Sources
   • Certifying Environmental Auditors
   • Certifying Respiratory Technicians
   • Certifying Audiometry Technicians

b) Successful hosting of the annual NUI Spring School for the re-certification of Radiation Safety Officers.

c) Actively participated with NUST and the Foundation for Professional Development (FPD) to establish the Namibian Uranium Association (NUA) Bursary Programme for Namibian students to further their education by studying towards a Namibian University for Science and Technology’s Post Graduate Diploma in Applied Radiation Science and Technology in Nuclear Sciences.

4 Industry Support

• Advisory service to all member companies at all levels regarding risk management, health, environmental and radiation safety and security
  • Ongoing interaction with MMEE’s SEMP office to ensure adherence to sustainable development Environmental Quality Objectives (EQA) for the Uranium industry in the Strategic Environmental Management Plan Report
  • Ongoing interaction with the NRPA and the Environmental Commissioner on the establishment of the Namibian Institute for Occupational Safety and Health (NIOSH)

5 Focus Areas

5.1 Focus on Transparency and Dialogue
Sustained and effective communication is essential for any organization. This is especially true in the case of the uranium industry where information and transparency are crucial. The NUI has an open-door policy and encourages constructive engagement with all stakeholders on an ongoing basis. The NUI’s interaction with Government, labour and other stakeholders is consistent and sustained. The Scientific Committee of the NUI includes respected independent scientists. The main forums for interaction are the NUI, working groups and through the Isaac Newton Forum, an initiative by the Scientific Committee of the Namibian Uranium Institute (NUI) to stimulate debate and to build bridges of understanding and tolerance between people.

The NUI has an open-door policy and encourages constructive engagement with all stakeholders on an ongoing basis.

5.2 Focus on Prevention
The uranium industry is committed to the sustainable development concept of product stewardship and has taken to heart a simple but enduring principle: Those that create risk are best placed to control that risk, whether employers, contractors or managers. Every uranium mine has an occupational health policy and strategy (either separate or integral with safety and/or environment), consistent with the company’s statement of business practice. It is therefore not surprising that Namibia’s uranium industry has one of the best combined health and safety records in the world.

Many studies have shown that supporting preventative and self-management programmes lead to dramatically improved outcomes. The NUI is a proponent of the prevention of injuries and illness associated with work and home. The NUI supports wellness programmes, risk assessments and appropriate health, environmental and radiation safety training. Zero harm is our objective. We actively support the NOSA programme and assist member companies to implement internationally recognized programmes such as ISO 14001 and OHSAS.

5.3 Focus on Standards, Guidelines, Training and Continuous Improvement
The NUI has already established itself as a reliable source of information and support for a never-ending campaign to improve knowledge, safety and the imple-
mentation of best practices in the field of health, environmental management and radiation safety. The NUI draws on existing information and uses the evidence generated from its work, alongside with the guidelines provided by the Namibian Government, Chamber of Mines of Namibia, World Nuclear Association (WNA), NEA and the International Atomic Energy Agency (IAEA) to influence policy and best practice for the future. The NUI plays a leading role in producing and implementing best practice standards to protect and promote the Namibian “uranium brand” and to co-ordinate occupational health, radiological safety and environmental management issues. As part of its product stewardship mission, the NUI developed partnerships with various service providers to develop a suite of standards, guidelines and training courses to cater for the needs of the uranium industry in Namibia. The Uranium Institute is officially registered with the Ministry of Labour and Social Welfare as an Authorized Inspection Authority (A.I.A Certificate (13/68)) for competencies in Health, Environment and Radiation Safety and Security.

5.4 Focus on Wellness and Health Management

Occupational medical programmes are in place at all mine sites to ensure that all employees are fit to perform their work safely. The programmes’ objectives are to identify and minimize occupational exposure and to screen for early evidence of both non-occupational and occupational diseases. The NUI’s Director coordinates the development, promotion and maintenance of workplace policies and programmes that ensure the physical, social and emotional well-being of employees and their families. In Namibia, all uranium mining and milling operations are undertaken under the Health and Safety Regulations of the Labour Act, the Atomic Energy and Radiation Protection Act and the Workers Compensation Act of Namibia. It sets strict health standards for exposure for both – workers and members of the public. Particular attention is paid to radon, a radioactive inert gas which is released to the atmosphere in very small quantities when the ore is mined and crushed. Uranium itself is only slightly radioactive. Precautions taken during the mining and milling of uranium ores to protect workers’ health include:

- Efficient dust control, because the dust may contain radioactive constituents and emit radon gas
- Limiting the radiation exposure of workers in mining, milling and tailings areas so that it is as low as possible and does not exceed the allowable dose limits set by the authorities
- The use of radiation detection equipment in all mines and plants and
- The enforcement of strict personal hygiene standards for workers handling uranium oxide concentrate.

5.5 Focus on Institutional Support

The concept of sustainable development is one of the cornerstones on which Namibia’s National Constitution and National Development Plan is built upon. Namibia also committed itself to a sustainable future, by adopting the United Nations Agenda 21 principles which cut across all sectors – social, economic and ecological.

The NUI interacts continuously with the governmental agencies in Namibia and is a proponent for the implementation of leading practice from “cradle to grave” which supports planning for mine closure before mine production is licensed, to ensure that the mining lease area is returned to an environmentally acceptable condition. Most of the uranium exploration and mining activities occur in the Central Namib, an ecologically-sensitive area containing parts of the Namib Naukluft National Park and Dorob National Park. Continued uranium exploration and mining could have a considerable effect on the natural environment as well as a cumulative impact on water and energy requirements, transportation, housing, schooling, and medical services. In 2006, the Government of Namibia put a moratorium on the licensing of uranium exploration and mining could have a considerable effect on the natural environment as well as a cumulative impact on water and energy requirements, transportation, housing, schooling, and medical services. In 2006, the Government of Namibia put a moratorium on the licensing of uranium exploration and mining and the uranium industry initiated a Strategic Environmental Social Economic Assessment (SEA) study. The SEA was independently conducted by the Ministry of Mines and Energy (MME), Directorate Geological Survey of Namibia (GSN) and its German Cooperation partner BGR through the Southern African Institute for Environmental Assessment (SAIEA). It is the first ever SEA & Strategic Environmental Management Plan (SEMP) for a mineral province. It was completed in 2010 and assessed socio-economic and environmental changes to determine whether, and in which way, uranium mining contributes to sustainability in Erongo Region and Namibia as a whole.

Subsequently, a Strategic Environmental Management Plan (SEMP) was developed and a monitoring function was created within the Geological Survey of Namibia in the Ministry of Mines and Energy – the SEMP office. Annually, the SEMP gathers data, assesses progress
towards meeting Environmental Quality Objectives (EQOs) and publishes annual reports summarising the sustainability performance in the Erongo Region. Initially the potential cumulative impacts on air quality had to rely on air dispersion modelling, supplemented meteorological, as well as dust monitoring stations. During 2015 the NUI approached the Government with the request to assist with an overarching air quality management plan so that mitigation measures can be implemented by the various role players in a coordinated and integrated way. The SEMP office project also wanted to conduct an advanced air quality management for the Uranium Province.

5.6 Focus on Evaluation and Self-Auditing

The collection of baseline environmental data, environmental monitoring and public consultation throughout the life cycle of the mine enables verification that a facility is operating as planned, provides early warning of negative impacts on the environment and keeps stakeholders informed of developments.

Central to the NUI’s strategy for improving knowledge and the implementation of quality of health, environment and radiation safety is a rigorous programme of evaluation and auditing. In 2012 and 2013, the NUI continued to work with the World Nuclear Association’s (WNA) Sustainable Development Working Standardization Task Group in developing a standardized list of items, with the goal to establish an internationally standardized reporting (checklist) between miners and utilities on the Sustainable Development performance of uranium/processing sites. Nuclear utilities are required to evaluate the sustainable development performance of their suppliers, especially when they are ISO 14001 certified.

The relationship with the Environmental Commissioner, the National Radiation Protection Authority (NRPA), the Strategic Environmental Management (SEMP) office and the Namib Ecological Restoration and Monitoring Unit (NERMU) is crucial. NERMU, housed at the Gobabeb Research and Training Centre, continues to monitor selected indicators in the SEMP, assists the SEMP Office, and develops and implements training courses and research projects on restoration and mitigation of mining impacts.

5.7 Focus on Opinion Research

In Namibia, workers, the public, visitors and scientists from around the world and from various institutions of learning visit the NUI. The NUI has an open door policy and invites constructive critique and opinions.

Negative public perceptions of uranium mining are largely based on the adverse health and environmental impacts of outdated past practices used when uranium mining was undertaken for military purposes. The driving force, as in all types of mining at the time, was maximising production, with little regard for health, safety and the environment. This early mining period left society with serious legacies of environmental damage and health impacts on workers and, in some cases, on the public. Today, societal expectations and regulation of the industry are directed much more towards radiation protection, environmental stewardship, health and safety.

(Managing Environmental and Health Impacts of Uranium Mining, NEA No. 7062; NUCLEAR ENERGY AGENCY)
In conclusion, uranium mining will continue to play an important role as a major contributor to our economy and poverty eradication strategies. The COP 21 (21st Conference of the Parties to the United Nations Framework Convention on Climate Change) agreement has given a strong signal that future investment in the energy sector should include low carbon technologies. Achieving the goal of a 2°C target would require a significant contribution from nuclear energy. Given that the agreement points towards targets below 2°C, the need for nuclear energy may even play a greater role.

More than ever, the NUI will be called upon to coordinate the uranium industries and improve knowledge transfer.

7.1 Evaluating the cumulative effects of uranium mining in Namibia

a) The Strategic Environmental Assessment (SEA)

Nine years ago – at the height of the worldwide boom in uranium mining and exploration, when demand for nuclear fuel for civil nuclear reactors was rising fast, the concept of a Central Namib Strategic Environmental Assessment (SEA) was initiated by the NUA members. The Namibian Government and in particular the Ministry of Mines and Energy, supported by the German Federal Ministry for Economic Cooperation and Development, through the Technical Cooperation Project between the German Federal Institute for Geosciences and Natural Resources (BGR) and the Geological Survey of Namibia (GSN) commissioned an independent strategic environmental assessment of the likely impact of expanded mining on the fragile ecology of the central Namib Desert inland from Swakopmund.

b) The Strategic Environmental Management Plan (SEMP)

The Central Namib Strategic Environmental Assessment (SEA) was completed in 2009-10 and was unique in two ways: the SEA was the first-ever regional appraisal of a uranium-producing district and provided a tool for the Namibian government in partnership with the local uranium industry to regularly monitor the impact of uranium mining and exploration not just on the health and the environment, but on the supporting infrastructure and its broader socio-economic effects.

The Strategic Environmental Management Plan (SEMP) acts as an over-arching framework and road-map for addressing the cumulative impacts of a suite of existing and potential developments linked to uranium mining. Organisationaly, the SEMP is a public-private collaborative programme housed within the Geological Survey of Namibia (GSN) part of the MME and supported by the Namib Ecological Restoration and Monitoring Unit (NERMU) of the independent Gobabeb Research and Training Centre. SEMP is essentially a process for identifying and mitigating or resolving the cumulative impacts of existing uranium mining operations and planned/potential developments. It also provides the context within which individual projects must be planned and executed, as assessed by 12 environmental quality objectives (EQOs).

Each EQO outlines a specific goal and sets a desired standard with key performance indicators, regularly monitored by annual SEMP reports. EQO topics include air quality and radiation, health, ecological integrity, local employment creation and training, infrastructure, water and socio-economic development. The latter provides an important measure of the value to Namibia’s economy of uranium mining, and measures the amounts paid to the government in taxes and royalties, and the proportion of goods and services procured locally, etc.

Although baseline studies and projections for various development scenarios were completed by the SEA research team, the implementation of the recom
mendations is the responsibility of the individual role players including industry and the authorities. However the Government remains responsible for the overall implementing of the SEMP through a close partnership between the Ministry of Mines and Energy (MME) and the Ministry of Environment and Tourism (MET). This is done through a broad-based steering committee that oversees the functioning of a small SEMP secretariat based at the Geological Survey of Namibia. Implementation of the SEMP began in earnest in 2011 and led to the publication of reports in 2013 and 2014. The latest SEMP report will be published in the first quarter of 2016.

The NUI plays a pivotal role in coordinating the uranium industry's responses to the SEMP report.

c) Encouraging future developments

At present the pressure on land and services has reduced because of a less optimistic outlook on the uranium price. However, two uranium mines are in going into production in 2016. The latest SEMP report will be published in the first quarter of 2016.

Public concern therefore increases about the effects of uranium mining on health in the towns of Arandis, Swakopmund and Walvis Bay. Specifically, emissions emanating from the mine sites via the atmospheric and aquatic pathways are perceived to present an unacceptable risk. All individual mines have implemented air and water quality management and monitoring programs which take responsibility within their fence lines. However, there are no mechanisms in place to assure the public of overall acceptable environmental performance in the region. A scarcity of publically available information aggravates the situation and allows the spreading of unhealthy anxiety among the public.

The NUI works hand in hand with the Working Groups of the NUA. Risk evaluation and mitigation are high on the agenda of the uranium industry.

d) The envisaged regional air quality management program

A regional air quality management program is envisaged consisting of three components

- Developing the air quality management plan
- Establishing a monitoring network, and
- Reporting monitoring results into the public domain.

The main objective of the program is to set agreed performance standards for the industry and other parties contributing to the regional emission inventory. A network will provide the results of monitoring cumulative air quality impacts from regional dust emissions. The critical parameter to be monitored is the inhalable fraction of ambient dust (PM10 dust) measured at the receiving environments of Arandis, Swakopmund and Walvis Bay. In order to address public concerns, input into the design of the management program needs to be sought right from the beginning, so that buy-in to the process can be achieved. A Steering Committee will govern the stakeholder engagement process. Information on the status of the air quality in the region has to be made available to the public continuously. This can be achieved through regular reporting or through making real time data available on line. The program can be implemented in a number of phases.

The Ministry of Mines and Energy, supported by the German Federal Ministry for Economic Cooperation and Development, through the Technical Cooperation Project, agreed to support such an initiative and a tender process is underway.

e) The envisaged regional groundwater monitoring program

The main objective of the 2009 SEA groundwater monitoring campaign was to establish baseline water quality information for the Khan and Swakop River catchments. The campaign was organised in the rivers between June and July 2009 and implemented by two teams with local and overseas specialists. The NUI scientists recommended the development of a re-adjustment of the regional groundwater monitoring program being carried out by the Department of Water Affairs and Forestry (DWAF) to allow conclusive public reporting of the status of the alluvial aquifers of the Khan and Swakop rivers. This is to be achieved by training new personnel at the DWAF and GSN during a comprehensive re-sampling exercise in the rivers. The choice of determinants for water quality analyses should align with recommendations from latest research carried out since baseline data were established by the SEA in 2009. It is recommended that results are communicated to assure the public of the state of the aquifers in respect of presence or absence of potential pollution.

Once again the Ministry of Mines and Energy, supported by the German Federal Ministry for Economic Cooperation and Development, through the Technical Cooperation Project, agreed to support such an initiative and a tender process is underway.
7.2 Training offered at the NUI

**Radiation Related Training:**
- Radiation Safety Officer’s Course – Part I
- Radiation Safety Officer’s Course – Part II
- Radiation Safety Officer’s Course – Part III
- Radiation Safety Winter School for Radiation Safety Officers
- Radiation Technicians Course
- Radiation Safety for Managers
- Radiation Safety when Dealing with Sealed Radioactive Sources
- Radiation Safety when Transporting Radioactive Materials
- Radiation Safety – Refresher Course for Radiographers & Persons working with Radioactive Sources and X-rays
- Introduction to Radiation & Uranium for members of the public
- Radiation Safety in Emergencies, and for Police Officers and Security Firms

**Health Related Training:**
- Audiometry Full Course
- Audiometry Refresher Course
- Lung Diseases Course
- Sonar Obstetric Course
- Spirometry Full Course
- Spirometry Refresher Course
- Respiratory Protection Workshop

**Environmental Related Training:**
- Environmental Auditing Certificate Workshop
- Understanding ISO 14001 Requirements
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