An Overview of Global Gender Initiatives for Women in the Nuclear and Radiological Fields

Julia Arapoff Culmen International Oak Ridge National Laboratory U.S. Department of Energy

Abstract

Currently, women make up less than a quarter of nuclear and radiological industry professionals; women are consistently underrepresented in leadership positions in the sector and are a minority in WMD¹ and STEM classes. Recognizing this problem in our industry, a growing number of region-specific groups (the Black Sea Women in Nuclear Network² and WiN Global subgroup Women in Nuclear Southeast Asia³), government created initiatives, and various fellowship and grant programs (the IAEA's Marie Sklodowska-Curie Fellowship Programme⁴ and CFRD Global's grant program⁵) work to increase female participation and success in this historically male-dominated profession.

While these valuable initiatives exist, there is no single, consolidated collection of resources for women in nuclear and radiological fields. This paper will attempt to fill that gap. It will: provide an overview of gender-based initiatives and opportunities, investigate these organizations' mission and purpose, highlight the lack of gender statistics at all working levels as a barrier for measuring gender parity improvement (site, state, country and international), and propose that these organizations leverage their networks and expertise to enhance gendered data collection in the field.

I. Introduction

From comprising a mere 20% of the nuclear industry (even less in the nuclear security-specific sector, especially in cybersecurity and weapons programs)⁶, 19.9% of science and engineering professionals, 15% of ambassador appointments, 14% of heads of State, 21.9% of ministerial positions⁷, 21.7% of UN permanent representatives⁸, and as little as 0-37% of the delegation for arms control, non-proliferation, and disarmament discussions⁹, women globally have been grossly underrepresented in all facets of nuclear fields.

Achieving gender equality and empowering women and girls is a fundamental human right¹⁰ and essential for innovation, performance¹¹ and profitability⁶. With the growing body of research strengthening the business case for diversity¹² and citing inclusion as a key success factor for teams¹³, gender parity is especially important in the nuclear and radiological sector due to the gravity of our work and the ever-increasing demand for scientists and engineers.¹⁶ Advancing peaceful applications of nuclear and radiological technology, increasing their safety and security, and utilizing diplomacy for a world free from nuclear threat requires talented, diverse perspectives¹⁴. To rise to these enormous challenges, women must be included in the talent pool and take an active role in decision-making, research, innovation, and diplomacy.

While there are more women in nuclear fields now than ever before, a lack of routine gender statistics in the field makes it difficult to see the full picture of progress made over time.¹⁵ Furthermore, the data on gender in nuclear fields that we do have is not comforting. A 2023

Nuclear Energy Agency "Gender Balance in the Nuclear Sector" Report found that the current 28.8% hiring rate for women in the nuclear energy sector would also represent the upper limit of female nuclear workforce representation after accounting for attrition, leaving us a long way from parity.¹⁶

Understanding the importance of attracting and retaining more women, numerous initiatives have been created to increase women's participation in nuclear-related fields, especially from a young age, to build a community of female experts and push for gender-balance policies. However, it can be difficult to find consolidated information regarding all the available resources. The following section attempts to bridge that gap.

II. Overview of Organizations and Initiatives for Women in the Nuclear Field

Africa Centre for Science and International Security (AFRICSIS)

AFRICSIS provides research-based policy recommendations to strengthen the nonproliferation regimes of chemical, biological, radiological and nuclear (CBRN) weapons and increase the public's, policymakers', media's, and African leaders' understanding of possible security threats to nuclear technology. It is actively encouraging more women to enter nuclear fields.¹⁷ Its efforts include working with the James Martin Center for Nonproliferation Studies (CNS) to develop various intensive courses for professors, researchers, practitioners, government officials, and other female professionals in Africa¹⁸, and partnering with other likeminded initiatives and groups (such as Women in Nuclear and the African Leadership Network) on shared gender parity goals.¹⁹

Black Sea Women in Nuclear Network

Established in December 2021 in partnership among the Odessa Center for Nonproliferation and Women in Nuclear Ukraine, the James Martin Center for Nonproliferation Studies, and the U.S. Department of Energy's National Nuclear Security Administration (DOE/NNSA) and Los Alamos National Laboratory, and with support from the Swedish Radiation Safety Authority, the Black Sea Women in Nuclear Network (BSWN) aims to: connect, support and empower women in the nuclear sector; amplify calls for an increase in women in leadership; and provide training, mentoring, and professional exchanges to an interdisciplinary cohort of women in Ukraine, Turkey, Romania, Bulgaria, Georgia, Moldova, and other countries in the region.²

Center for Feminist Foreign Policy (CFFP)

As the first organization aimed at promoting Feminist Foreign Policy (FFP) around the world, contributors use their expertise to tackle some of the most pressing foreign policy problems, from international cooperation and human rights to peace and security. CFFP researchers publish feminist takes on current nuclear weapons policy issues, promote women and non-binary people in foreign policymaking through their Network F community and knowledge hub, and diversify policymaking by connecting female experts to policy makers through their WoX Network.²⁰

Center for Strategic and International Studies (CSIS)

Project on Nuclear Issues (PONI)

Founded in 2003 with a research focus on deterrence and escalation, risk reduction and arms control, and disarmament, PONI seeks to develop the next generation of nuclear professionals

through conference series, deep dive workshops, a Nuclear Scholars Initiative aimed at graduate students and young professionals, and a Mid-Career Cadre program readying experts with seven or more years of experience for leadership positions.²¹

Smart Women, Smart Power Initiative (SWSP)

Creating space for women in national security and foreign affairs, SWSP hosts a speaker series, publishes a bi-weekly podcast with female trailblazers across the globe, and uses a gendered lens in their analysis of pertinent international relations and national security challenges. PONI and SWSP's five-episode podcast series features female experts discussing cyber deterrence, the role of the United States Congress in nuclear policy, being career pioneers, the future of arms control treaties, and the future of the Treaty on Nonproliferation of Nuclear Weapons.²²

CRDF Global

An independent nonprofit supporting women in STEM and security through various fellowships, grant programs, and publications⁵ including: collaborating with Global Affairs Canada to financially support grant projects for international women working in nuclear security and nonproliferation; supporting year-long nonproliferation fellowships for women in emerging countries through the Robin Copeland Memorial Fellowship (RCMF); publishing a best practice guide focused on the importance of including and advancing women in STEM and security; and providing fellowship, professional development, and mentorship opportunities for Iraqi women working in chemical security.²³

Gender Champion in Nuclear Policy (GCNP)

A leadership network for nuclear policy heads modeled after the International Gender Champions network, GCNP brings together high-level officials in nonproliferation, disarmament, security, safeguards, deterrence, nuclear weapons policy, and nuclear energy to obtain gender balance commitments at leadership levels. As heads of their organizations, GCNP members can use their platforms to prioritize gender equity and enact powerful change.²⁴

Health Physics Society (HPS), Women in Radiation Protection (WiRP)

A section of the HPS, a nonprofit organization of scientific professionals in the United States formed in 1956 to promote the practice of radiation safety, WiRP aims to advance women and other underrepresented groups in healthy physics and related disciplines.²⁵ Highlighting exceptional female HPS members and past and present leaders advocating for professional development opportunities, WiRP works to increase the participation, recognition, and retention of women in the radiation safety field.²⁵

International Atomic Energy Agency (IAEA)

Through gender balanced hiring practices, supporting the UN's Sustainable Development Goals (SDGs) to achieve gender equality by 2030, and including gender equality in their Nuclear Security Plan, the IAEA has taken a clear stand on gender parity in the nuclear field.²⁶

Group of Friends for Women in Nuclear

Formed as a mechanism for regular communication on the representation of women in the Agency, the Group assists the IAEA in identifying barriers to the advancement and recruitment

INMM & ESARDA Joint Annual Meeting, May 2023

of women and with the development of practical initiatives to achieve gender equality at all levels.²⁷

Marie Sklodowska-Curie Fellowship Programme (MSCFP)

A scholarship program for women pursuing a master's degree in a nuclear-related field and pipeline for an internship with the IAEA, the MSCFP supports gender-balanced capacity building, accepting around 150 qualified women a year in nuclear safety, security, nonproliferation, energy, and various other nuclear applications to rectify the underrepresentation of women in these field.⁴

Lise Meitner Programme (LMP)

Geared toward early and mid-career female professionals in nuclear fields, the LMP is a multiweek cohort-based, career development visiting program. With a focus on the nuclear energy field, the program curriculum includes nuclear facility visitations, interactive training, and technical assignments and discussions. LMP graduates will gain improved leadership and management skills, mentoring opportunities, and expand professional networks.²⁸

Women in Nuclear Security Initiative (WINSI)

Launched by the IAEA's Division of Nuclear Security (DNS) in 2021 as a WiN Global interest group, WINSI exemplifies the IAEA's efforts to be a pioneer for gender parity in nuclear, supporting the achievement of gender equality both within DNS and the global community at large.²⁹

International Gender Champions

The International Gender Champions (IGC) leadership network gathers high-level officials to make substantive changes toward gender equality in their organizations. Known for their panel parity pledge, annual reports, commitment guides, and resource packs, IGC provides concrete steps for influential leaders, granted with immense decision-making power, to advance gender parity.³⁰

Gender Champions in the Nuclear Field

The IGC Impact Group on Gender Equality in Nuclear and Regulatory Agencies works to create a community of agency and organization heads "committed to address gender issues in their institutions, countries and with international partners". With a focus on the nuclear field, the Group supports youth education to create a more robust pipeline for women into the field, implements policies to recruit and retain women, and promotes diversity in the workplace and in delegations and panels.³¹

James Martin Center for Nonproliferation Studies (CNS) Young Women in Nonproliferation Initiative

Located at the Middlebury Institute of International Studies at Monterey, CNS is the largest NGO in the United States dedicated entirely to nonproliferation training and research. To promote diversity, equity, and inclusion (DEI), CNS has partnered and worked closely with Women of Color Advancing Peace and Security (WCAPS) and in 2018 created their Young Women in Nonproliferation Initiative -- an unparalleled resource for women interested in disarmament, nonproliferation, and WMD. The guide highlights novel publications on the

relationship between WMD and gender and showcases female experts' analysis of nuclear issues; and shares resources to identify qualified female experts, NGOs with a gender focus, organizations committed to gender balance, and a list of internship and training programs.¹

Nuclear Energy Agency (NEA) Gender Balance Task Group (GB-TG)

The Gender Balance Task Group demonstrates the NEA's commitment to advancing nuclear safety, technology, science, environment, and law, and recognizing the importance of women in STEM for creating an innovation workforce in nuclear energy. Bringing together foremost industry experts, researchers, academics, and government officials, the GB-TG works to collect vital data on gender balance in STEM and leadership positions in nuclear energy, develop policies for an international audience, and advance the participation of women in this sector though engagements and activities.³²

Nuclear Security Women Initiative (NSW)

The Nuclear Security Women (NSW) initiative was created in 2020 by DOE/NNSA's Office of International Nuclear Security (INS) after seeing firsthand just how few women were in attendance of their bilateral and regional engagements. Through "Coffee Talks" that share best practices, challenges, and successes in an informal environment, working closely with other organizations focused on women in nuclear fields, and developing educational modules to be shared at large events and as part of professional development programs, NSW aims to increase women's representation in all aspects of nuclear security.³³

The United Nations Institute for Disarmament Research (UNIDIR) Gender & Disarmament Programme

As an autonomous institution within the United Nations, the UNIDIR supports the UN and Member States in conducting research for a more peaceful world in which people are protected from arms-related threats and violence. The Gender the Disarmament Programme within the UNIDIR recognizes that while the number of women participating in nonproliferation, arms control, and disarmament diplomacy has grown, they remain underrepresented. The Programme uses a gendered perspective in their research, conducts outreach activities, and shares tools to make concrete strides toward their strategic goal of achieving gender equity in disarmament forums.⁹

Women in International Security (WIIS)

Founded on the consensus that female empowerment and leadership is essential to counter critical global security challenges, the WIIS professional development global network has attracted over 15,000 members worldwide with their intersectional approach to international peace and security. Dues based, members are granted access to the WIIS portal to meet members and share their professional profile and publications, the WIIS job hotline, publishing opportunities on the blog, and career development opportunities such as mentoring.³⁴

Women in Nuclear (WiN) Global

Founded in 1992, with 35,000 members from 129 countries, and 42 national, regional, and international chapters around the world, this global nonprofit is one of the foremost organizations supporting women in the nuclear sciences. With aims of sharing the benefits of nuclear and radiation applications, raising awareness of safety measures to protect the public and

environment, and attracting more young women and people into the field to create a diverse, gender balanced cohort, WiN Global members host an annual conference to network and exchange ideas and information.³⁵

WiN Southeast Asia (WiNSEA)

Focused on empowering women working in nuclear technology in Southeast Asia, WiNSEA has conducted an initial assessment of its members to identify challenges, developed a mentorship discussion series, utilized social media platforms to create networks for female nuclear security professionals, and is continuing to promote gender parity in the region and beyond.³

Women in Nuclear World Nuclear Association (WiN WNA)

Formalizing the partnership during a virtual ceremony in 2021, WNA and WiN agreed to collaborate on joint activities and projects that support their shared goal of advancing nuclear science and technology and mentorship to bring the next generation, especially young women and girls, into the industry.³⁶

Women's International League for Peace and Freedom (WILPF)

Comprising 41 sections and five regional groups across the globe, the NGO Women's International League for Peace and Freedom (WILPF) is the oldest women's peace group in the world, founded on the ideals of freedom, justice, human rights, permanent peace, and equality for all.³⁷ The disarmament program of WILPF, Reaching Critical Will, aims to promote new perspectives and affect policy in the field with overviews of various disarmament fora, such as the Nuclear Non-Proliferation Treaty, Treaty on the Prohibition of Nuclear Weapons, and Convention on Certain Conventional Weapons, fact sheets, and in-depth disarmament research and advocacy.³⁸

Women of Color Advancing International Peace, Security and Conflict Transformation (WCAPS)

Brainchild of Ambassador Bonnie Jenkins, WCAPS was created with the profound understanding that advocating for gender parity that, "does not meaningfully include diverse perspectives," including various racial, educational, economic, linguistic, and geographical backgrounds, "is counter-productive to gender equity, and to women's peace and security, worldwide."³⁹ WCAPS and their various country chapters utilize mentorship and pipeline programs to bring girls and women of color into the fields of international peace, security, and conflict transformation, create support networks to retain the women in the field, and advocate for the vital importance of women of color seeing themselves in the field and positions of influence they seek.⁴⁰

Women Transforming Our Nuclear Legacy (WTONL)

A global mentoring program aimed at building the next generation of women involved in nuclear nonproliferation, disarmament, and peace, WTONL is a non-profit, non-partisan initiative under NuclearWakeUpCall.Earth. To inspire women and girls to influence nuclear policy and build nuclear literacy, WTONL hosts online mentoring sessions, from a history lesson on the legacy of nuclear testing to an analysis of various peace pathways in North Korea, all available in their digital library.⁴¹

#WomenWagingPeace Nuclear Age Peace Foundation (NAPF)

The Nuclear Age Peace Foundation, a non-partisan, non-profit group focused on peace and disarmament founded in 1982, launched their #WomenWagingPeace to bring women's voices to the male-dominated fields of military, defense, and nuclear-weapons policy. The group held their first annual luncheon in 2022 to discuss disarmament and cheer on the women supporting NAPF's mission.⁴²

World Institute for Nuclear Security (WINS) Gender Program

Launched in 2018 to counter low female participation in nuclear security, the WINS Gender Program centers its program around gender parity.⁶ WINS has developed a comprehensive best practice guide on promoting gender parity, published regular reports on gender in the nuclear field, and created a self-assessment and action plan tool for organizations to evaluate where they stand in championing gender parity in their workplace. They have taken concrete steps to not only survey members and better the organization, but to serve as a valuable resource for other organizations in the nuclear industry striving for the same.⁴³

III. Research Applications

Access to and knowledge of the gender-focused organizations, initiatives and resources is incredibly important for helping attract and retain women in the nuclear sector. Section II of this paper can be used as a resource guide for young women entering the field seeking career opportunities, as well as more seasoned professionals who want to expand their professional network, professionals making a career change, leaders looking to make a more substantive impact on gender goals, and as a way to match mentors with mentees. This paper encourages the INMM community to share the resources in section II with women in this sector within their offices; consider partnership or participation in the groups to create a gender-focused branch or initiative within their home organization; and assess their own gender and DEIA policies.

In the next section, this paper will discuss opportunities to leverage the organizations in section II for a more concerted data collection effort.

IV. Gender Data

How successful are the initiatives at increasing women's participation in the field? Have they made a material impact on their community? How welcome do women feel? Gender statistics can help us evaluate and answer these types of questions.

What are Gender Statistics and Data Gaps? Why Should We Care?

Gender statistics are data that is collected and presented using sex as a primary classification. Reflective of gender issues, based on concepts that reflect the diversity of women and men, and mitigating potential stereotypes or sociocultural factors that could lead to bias when collecting data,¹⁵ these statistics use a gendered lens to understand differences in outcomes, opportunities and access to services and are imperative to address and track progress on inequities.⁴⁴

Data gaps related to gender statistics can refer to absence, poor quality, infrequency, inadequate methodology, or inaccessibility, all of which pose challenges to routine gender data collection and analysis.¹⁵ The lack of high-quality, international gender data hinders reporting on gender parity progress made over time and makes it difficult to evaluate the effectiveness of current

policies and design and implement new policies.¹⁵ Without this essential information, we will never achieve gender parity.

Current Gender Data Gaps

While the global demand for gender data has continued to increase, it has not been matched by an increased supply.⁴⁴ The available data is often methodologically flawed and incomplete, hindering the effectiveness of economic and social policies and enabling systemic, gendered social and economic inequities to persist.⁴⁴

For example, in the field of diplomacy, the body of scholarship on gender in the ministry of foreign affairs (MFA) is both small and dated, leaving uncertainty regarding the number of women and non-binary or gender nonconforming persons on the international diplomatic stage (and in what capacity.)⁷ Additionally, only 26% of UN countries have comprehensive systems in place to track public allocations for gender equality and only 13% of Member States reported data for at least half of the UN gender equality and women's empowerment Sustainable Development Goal (SDG) indicators. These include access to education (including STEM), employment rate and pay, and participation and leadership levels in decision-making spheres like politics and business, all of which are essential data points for the nuclear field.⁴⁵

While a handful of surveys and self-assessment tools for women in nuclear and radiological fields have been created,¹ there remains an absence of comprehensive, routine, publicly available data collection on gender at all levels (site, department, organization, field, state, country, international, etc.) in the industry.

V. Recommendations

How Global Gender Initiatives Can Help Mitigate the Gender Data Gap

Currently available surveys have been conducted solely on the surveying organizations' own members. While this is useful to have, it does not adequately represent the views, experiences or realities of the broader nuclear sector. To thoroughly understand the state of gender inequity in the field and to most accurately track progress over time, the entire international nuclear sector should undertake a data-driven, qualitative and quantitative survey campaign.

This paper proposes that the gender organizations and initiatives listed in section II can play a vital role in enhancing our gendered data in the field: spreading the importance of data collection for establishing a baseline, informing effective policies, measuring gender progress over time, and encouraging the various members' home organizations to commit to both surveying the state of gender equality in their organizations and sharing the data with the broader international nuclear community. It implores that further research be conducted on the best method for

¹ For example, in 2019 WINS conducted a first-of-its kind survey of members' attitudes toward gender and nuclear security¹⁹; IGC conducts an annual survey of its members, recording the percentage of Champions who adhered to the Panel Parity Pledge (PPP), Gender-Based Violence Pledge (GBV), and various commitments related to executive management and programmatic work**Error! Bookmark not defined.**; and the NEA published the first publicly available international data on women in the nuclear energy sector, establishing a baseline for gender imbalance in the sector.¹⁶ Major findings of the NEA Report include women comprising about a quarter of the nuclear energy workforce, more predominately serving in the nontechnical areas of the sector, and representing less than 20% of upper management or executive positions, but the NEA countries surveyed were Eurocentric, a limitation for global application of the findings.¹⁶

leveraging the aforementioned gender organizations' networks and working with existing data collection and statistics initiatives (for example, NEA, UN Women's "Women Count", OECD's gender statistics program, and the World Bank) to close the gender data gap; increasing the number and bettering the experiences of women in all facets of the nuclear field by creating a sector-specific initiative aimed at reporting on women in nuclear field. With sector-specific indicators such as how much women are paid in each position, the number of women serving in leadership positions, the number of women promoted or trained, the number of female hires, and the number of women in technical sectors of the industry, and by assessing women's experiences through qualitative questions, one can compare progress over time, across departments and industries, and create and adhere to parity goals.¹⁹

VI. Conclusion

As the number of organizations and initiatives for women in nuclear and radiological fields increases, it is important to make the entire community aware of the available resources as each member must play a role in working toward gender parity. While all these organizations have the shared goal of increasing the number and experience of women in the field, the lack of gender data makes it difficult to properly measure progress. The existing organizations and initiatives for women in nuclear and radiological fields provide a wealth of resources, knowledge, and passion. By leveraging these organizations to promote the importance of data collection, the broader nuclear community would benefit from a more diverse and equitable industry working on some of the most important technology, security, climate, and peace issues of our age.

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