INSIGHT






This Issue's Feature:

Diversity in Systems Engineering

"Our diversity is not our problem. Our diversity is our promise."

— US Congressman Elijah Cummings






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INCOSE®

Towards a More Diverse INCOSE

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■ **ABSTRACT**
We often talk about the lack of women in the engineering workforce, and more broadly the need for diversity and inclusion (D&I) in our enterprises. Within INCOSE, the Empowering Women Leaders in Systems Engineering (EWLSE) initiative advocates both for women as leaders in systems engineering and for improved understanding and responses to the wider diversity issues.

Let us assume that INCOSE is not as diverse as we would hope in an ideal world. Let us agree that evidence-based decisions on how to evolve INCOSE towards that idea are desirable. This paper will establish an understanding of INCOSE's current diversity based on available data, and in doing so will answer the following questions:

1) Why is it important for INCOSE to be diverse?
2) What do we mean by diversity with respect to INCOSE?
3) What do we know about INCOSE diversity today, and how does it compare to equivalent societies and the wider communities in which we operate?
4) Where are the gaps and what can we do to improve INCOSE diversity?

■ **KEYWORDS:** diversity, inclusion, gender, engineering, INCOSE

INTRODUCTION

Systems engineering is all about achieving successful outcomes, and there is no more important outcome than the INCOSE vision statement, "a better world through a systems approach." The "INCOSE Systems Engineering Vision 2025 (INCOSE 2014)" discusses the many challenges facing human society and the required transformation of systems engineering necessary to enable us to meet those challenges. To meet these challenges, it describes the systems engineering workforce of the future as "geographically dispersed, culturally diverse, gender agnostic, multi-disciplinary, and transgenerational."

This paper focusses on INCOSE's role in promoting and helping to achieve this diverse and inclusive future workforce. There is much literature in this area, although no good single global reference. One good informal definition for diversity and the related activity of inclusion used in this paper refers to diversity as "the mix of people," and inclusion as "making the mix work (Arya 2017)." These definitions work well for systems engineering because it is an activity centred on purpose–and "making the mix work" here refers to both bringing the mix of people together and achieving effective systems engineering outcomes.

This paper seeks to understand the relevance of diversity to systems engineering and to INCOSE, the current diversity situation in INCOSE, how this relates to the wider global engineering community, and to identify recommendations to INCOSE to enhance the situation. While the subject of this paper is diversity, most of the data collected and presented relates to male-female gender balance. The section entitled "Wider Aspects of INCOSE Diversity" complements this data with anecdotal examples on other areas of INCOSE diversity.

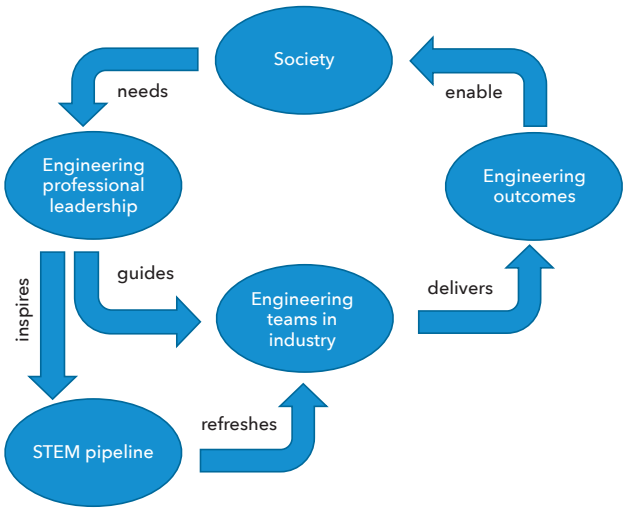

Figure 1. How engineering contributes to society and the key role of engineering professional leadership

Why Diversity in Engineering Is Important

Figure 1 illustrates the context for this paper, showing how engineering is an important contributor to society and how engineering professional leadership (at global and national levels) has a key role both to guide professional practice in industry and to inspire the STEM pipeline.

Engineers apply ingenuity, innovation, and systematic approaches to solve challenging problems. Life experience and academic research shows us that bringing a wide range of skills, knowledge, and thinking styles to bear on a problem is the most effective way to accelerate and improve the intended outcomes. By contrast, a team of people with the same cultural background, life experiences, education, and thinking style could be expected to be relatively less

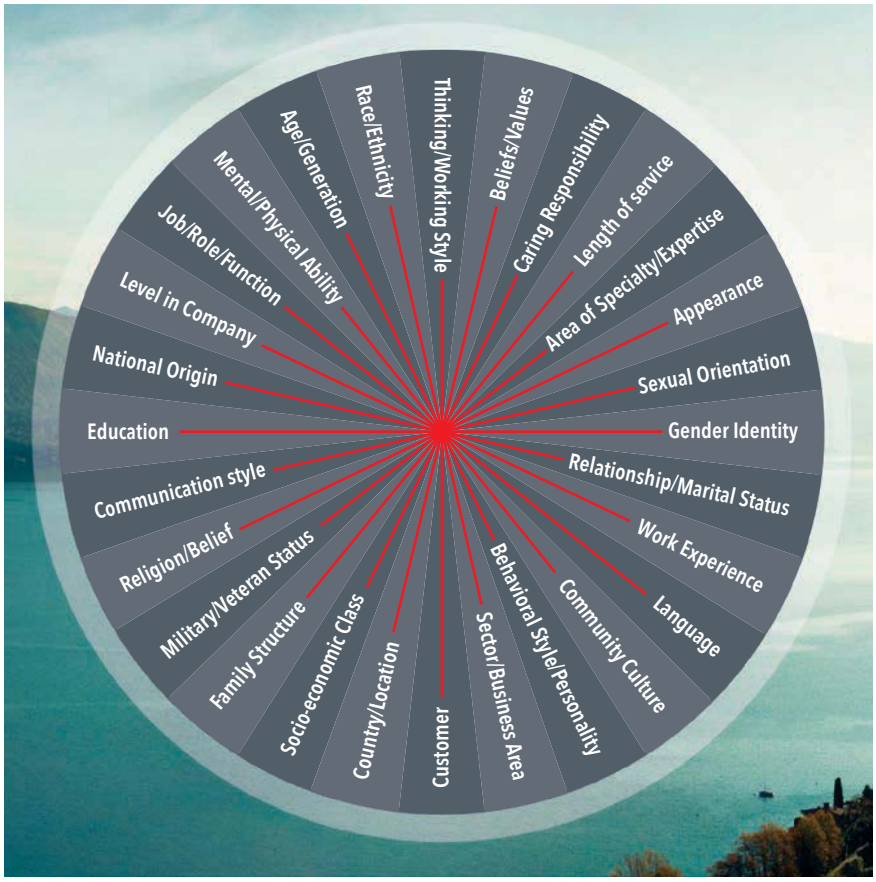

Figure 2. BAE Systems Air (UK) dimensions of diversity (used with permission, all rights reserved)

effective and more prone to identifying predictable solutions. There are several references on this subject including:

- The US National Academy of Engineering has identified the drivers for diversity in engineering as: equality, numbers, but most of all quality of the engineering performed (National Academy of Engineering 2002, 8). Further, they note the opportunity cost of a lack of diversity in terms of "designs not thought of, in solutions not produced."
- The UK Royal Academy of Engineering (2015) has demonstrated that "the business benefits of a more diverse workforce…potentially include positive impact on an organisation's financial performance, greater innovation and creativity, increased employee productivity and retention, improved customer or client orientation, and increased customer or client satisfaction."
- Hunt et al. (2018) have found that companies at the forefront of gender and ethnic/cultural diversity in their leadership perform better financially.

So, in summary, the reason for diversity in engineering teams is to ensure that we achieve the best possible engineering outcomes, which in turn contribute to a better society and hence "a better world."

Why Is It Important for INCOSE to Be Diverse?

Engineers apply systems engineering to a wide range of system types in a wide variety of contexts–engineered systems range from micro-electronics to aircraft, from abstract systems to smart cities. Systems engineers may be working with a customer, a prime contractor or integrator, a supplier or product manufacturer, a research/technology organisation, or a government body. And these activities take place all over the globe, often as part of consortiums or complex partnered programmes involving multiple organisations, countries, and cultures.

Wherever we apply systems engineering, it requires consideration of multiple viewpoints (such as the user, maintenance, safety, security) so that we can achieve the proper holistic view of problem and solution. This means that the systems engineering team must be able to understand and work with a wide range of stakeholders. The transdisciplinary and integrative nature of systems engineering across other disciplines and activities, again, means that the systems engineering team needs to understand and work well with all the disciplines and specialities involved in realising a system (Sillitto et al. 2018).

Given this diversity of context and of types of systems engineered, and the wide range of stakeholders with whom they need to work, it is reasonable to assert that the systems engineering workforce and culture should be at the forefront of diversity and inclusion (D&I). In this way, we can represent as many aspects of the diverse community and their needs as possible within the team, and the diverse nature of the team also creates the innovation from which we can realise the best solutions.

As the global authority on systems engineering, and having established that systems engineering needs to be at the forefront of D&I, INCOSE itself also must be a leader of D&I to achieve its vision. Accomplishing the INCOSE mission "to address complex societal and technical challenges by enabling, promoting, and advancing systems engineering and systems approaches" will further enable this goal. INCOSE already recognises diversity in its principles, which include the principles of "respect, diversity, collaboration" described as "building and maintaining respectful relationships internally and externally to enable effective collaboration across the diverse community (INCOSE 2014)."

What Do We Mean by Diversity with Respect to INCOSE?

Earlier this paper adopted informal definitions of diversity as "the mix of people," and inclusion as "making the mix work." Different sources define diversity in a range of ways, and these definitions depend on organisational culture and history. Looking to expand this understanding, Figure 1 below shows the 28 dimensions of diversity used in BAE Systems (Arya 2017), reflecting a rich set of aspects related to a person's intrinsic characteristics, environment, family, and interaction styles.

To aid understanding of these dimensions, Table 1 shows them arranged into five groups. Within the groups, the dimensions range from the simple publicly perceivable fact, such as age or generation, to aspects of a person that may be personal which we may regard as private, such as beliefs and values.

So, what do we mean by diversity with respect to INCOSE? It is a mixture of what is important to INCOSE as a professional engineering society; what we can understand and measure; and what is appropriate to know and retain about individuals. Given that INCOSE is a global organisation, one other key factor is which aspects

Table 1. Catagorized dimensions of diversity

Intrinsic	Environment	Family	Employment	Interaction
Age/generation	Country/location	Family structure	Level in company	Communication style
Gender identity	National origin	Relationship/ marital status	Job/role/function	Behavioural style/ personality
Sexual orientation	Race/ethnicity	Caring responsibility	Area of speciality/ expertise	Thinking/working Style
Mental/physical ability	Community/culture		Length of service	
Appearance	Language		Customer	
Beliefs/values	Socio-economic class		Sector/business Area	
Religion/belief	Education		Work experience	
			Military/veteran status	

Key: Green–data included on regular INCOSE membership application. Yellow–data included on INCOSE certified systems engineering professional (CSEP) application. Blue–data optional on INCOSE CSEP application

have meaning and relevance internationally since national/cultural views on aspects including gender identity, sexual orientation, and religion/beliefs can vary significantly.

We will leave a comprehensive analysis of these dimensions, their definitions, and their applicability to INCOSE for a future task. It will require careful discussion to ensure that we adopt an appropriate inclusive approach that respects all points of view and that ensures that we carefully manage and protect all personal information. In advance of these discussions, there is no established INCOSE data on diversity directly available. Therefore, in order to establish an initial baseline position, this paper uses two dimensions that we derived from data that is currently available:

- Gender: male/female derived from the forename(s) of the individual
- Country/location: sector or country derived from the country of residence of the individual.

Using these two dimensions, sections "INCOSE Membership" through "External Engineering Diversity Data" of this paper look at three aspects:

- Membership: reflecting who we are right now
- Leadership: reflecting how we are led and who we look up to
- Awards: reflecting who we recognise and who we aspire to be

INCOSE Membership

We analysed INCOSE individual member data as of the end of June 2018, using available data spanning the period August 2015-June 2018. We chose this period because it represents the data available in the member database. When we could not derive gender from the data because of a gender-neutral name, we excluded that data from the analysis. This has only removed a small percentage of data and so has not significantly affected the results.

Table 2. Global individual membership %female members

Membership type	% women (Aug 2015)	% women (Jun 2018)
Individual (All)	16%	17%
Full (excludes senior, student)	14%	15%
Senior	7%	8%
Student	21%	22%
Associate	21%	19%

Global Membership

The first analysis completed was of total individual membership, including both full members and associate members. In June 2018, female members made up approximately 17% of INCOSE individual membership. This figure has risen slightly from 16% in August 2015. Table 2 unpacks this into differing membership types.

In this table:

- Student membership refers to people of any age who are enrolled in a university or college as a student seeking a degree, not employed more than ¼ time outside the university in which they are enrolled, and their course load is at least ¾ of full time.
- INCOSE senior membership is available to people over 65 years of age who have been full members of INCOSE for at least 5 years.
- Associate membership is available to employees of organizations that are members of the INCOSE Corporate Advisory Board (CAB), and universities that are members of the INCOSE Academic Council (AC).

From the data we can see the following:

- Female gender balance is increasing between the 2015 and 2018 data.
- Female gender balance is greater in the membership types typically associated with younger members (student) compared with senior members.

During compilation of this report, it was possible to get some comparative data from the Institute of Electrical and Electronics Engineers (IEEE) and the Institution of Engineering and Technology (IET), two of the largest engineering societies in the world with 400,000 and 168,000 members respectively worldwide. Both have a well-organised and led approach to diversity and inclusion and were keen to contribute to this paper.

The requirements for student membership between INCOSE, IEEE, and IET are broadly comparable for the purposes of this paper.

From Table 3 we can see that:

- The trend towards greater gender balance in typically younger membership grades is consistent.

Table 3: Global individual membership % female members compared with other societies

Membership type	INCOSE (2018)	IEEE (2019)	IET (2019)
Individual (All)	17%	12.2%	9%
Student	22%	14.8%	21%

- INCOSE's overall individual membership female percentage is significantly better than these two comparators.
- INCOSE's student membership female percentage is broadly the same as that for the IET, and better than IEEE.

Sector Membership

Table 4 shows the gender diversity in each of the three INCOSE sectors over the period of the review. All three sectors show improvement in the period. Sector I is the sector with the greatest percentage of women at present, with Sectors II and III approximately equal.

From the data we can see the following:

- Female gender balance is increasing between the 2015 and 2018 data.
- Female gender balance is greatest in Sector I (US-dominated), and Sectors II and III are very similar percentages.

National Membership

Table 5 shows the gender diversity of the INCOSE national chapters that manage their own membership, plus the US (using the gender data from Sector I data because this sector is dominated by US-based members). We have ordered the data in decreasing order of percentage of women members. We have also shown the total number of members in each country. A row showing the global average gender diversity is highlighted towards the middle of the table.

From the data, we can see that there is a marked difference between the countries represented. It invites the question of how these national statistics compare with each country's engineering population. We will explore this in this paper's section entitled "External Engineering Diversity Data."

Table 4. Sector individual membership % female members

Membership Type	% women (Aug 2015)	% women (Jun 2018)
Individual (All)	16%	17%
Sector I (Americas)	17%	19%
Sector II (Europe, Middle East, Africa)	11%	13%
Sector III (Asia Oceania)	8%	12%

Table 5. INCOSE national chapter individual membership % female members

Nation	Sector	Total members	% women (Jun 2018)
China	III	206	35%
USA (based on Sector I)	I	5060	19%
Italy	II	140	19%
South Africa	II	575	18%
France (AFIS)	II	920	18%
All Individual Members	**All**	**16950**	**17%**
Israel	II	212	13%
India	III	342	12%
Australia	III	630	11%
UK	II	905	10%
Sweden	II	148	9%
Netherlands	II	470	8%
Germany	II	610	6%

INCOSE Leadership

We have assessed the diversity of the INCOSE leadership community by a review of the INCOSE organisation charts as of January 2019. This assessment is important because the leadership community is both the public (external) face of INCOSE, and includes the people who are the most visible to INCOSE members through written communications and increasingly via social media. As of January 2019:

Six (33.3%) of the 18 members of the INCOSE Board of Directors (BoD) are female, including 2 (50%) of the officers. For comparison, this figure exceeds the target set by the US Thirty Percent Coalition goal of 30% female representation across public company boards (paid positions). As further historic context, 4 (19%) of the 21 people who have been elected as INCOSE President have been women, the first in 1996 and, most recently, the current President-Elect.

Of 63 chapter leads across INCOSE, 11 (17.5%) are female, a figure in line with the overall representation of women in the INCOSE membership.

Technical Operations is the largest functional area within INCOSE, representing the leadership and management of global working groups and initiatives. One (5.5% percent) of the 18 Technical Operations leadership roles is female. Further, 14 (14.3%) of the 98 working group chairs and co-chairs are female, below the overall representation of women in INCOSE. These figures for Technical Operations stand out as an area for consideration and improvement.

The Corporate Advisory Board (CAB) is the voice of the corporate customer spanning government, industry, and academia. Thirteen (11.8%) of the 110 CAB and AC representatives are female.

INCOSE established the Institute for Technical Leadership (TLI) to accelerate the development of international leaders in systems engineering. The institutute has admitted four cohorts of TLI since its creation. Currently, 11 (18.6%) of the 59 members are female.

INCOSE currently has almost 4000 certified Systems Engineering Professionals (SEP), most of whom are individual members of INCOSE. Based on an analysis of this data, females make up 17.9% of the SEP population (we excluded records when we could not ascertain gender).

Table 6. International Workshop attendance

Event	Total attendance	% women
IW 2015 (Torrance, US-CA)	387	17.8%
IW 2016 (Torrance, US-CA)	369	17.6%
IW 2017 (Torrance, US-CA)	435	20.9%
IW 2018 (Jacksonville, US-FL)	361	17.5%

Table 7. International Symposium attendance

Event	Total Attendance	% women
IS 2015 (Seattle, US-WA)	550	19.3%
IS 2016 (Edinburgh, GB)	478	16.7%
IS 2017 (Adelaide, AU)	371	20.8%
IS 2018 (Washington, US-DC)	610	19.7%

- Associate Systems Engineering Professional (ASEP): 18.3%
- Certified Systems Engineering Professional (CSEP): 18.8%
- Expert Systems Engineering Professional (ESEP): 11.4%

Participation in INCOSE Events

Attendance data is available for the two flagship global INCOSE Events–the International Workshop (IW) held in January each year, and the International Symposium (IS) typically held in July each year.

We reviewed the attendance at these events using the list of attendees made available to IW participants. This list contains fewer attendees than the number that actually attended each event because at registration people are given the choice of having their name and contact details published in the attendee list. It was not possible to ascertain the gender of several attendees who we excluded from the results.

From this international events data, we can see that gender balance is generally a little above the global membership figure of 17%.

INCOSE Awards

The awards given by an organisation are a good indicator of what the organization values and celebrates. For INCOSE, its main international awards are:

- INCOSE Pioneer
- INCOSE Founder
- INCOSE Outstanding Service Award
- INCOSE Fellow

The INCOSE presents its Pioneer Award annually to one distinguished individual, who by their achievements in the engineering of systems has contributed uniquely to major products or outcomes enhancing society or its needs. Zero (0%) of 22 recipients have been female. The absence of female recipients of the Pioneer Award is not unexpected due its recognition of a whole career, the historic under-representation in the engineering workforce, and also potential under recognition in awards of this type.

The INCOSE Founders Award is a highly prestigious award presented annually to one distinguished member of INCOSE who has made a major contribution to INCOSE. Seven (26%) of 27 recipients have been female.

INCOSE presents Outstanding Service Awards to recognize INCOSE members who have contributed significant volunteer effort on behalf of INCOSE. Sixteen (11%) of 140 recipients have been female.

INCOSE Fellows are individuals with significant verifiable contributions to the art and practice of systems engineering in industry, government, or academia. Of the 93 INCOSE Fellows appointed since 2001, 7 (7.5%) are female. As with the Pioneer Award, historic factors may play a part here.

External Engineering Diversity Data

It is useful to contextualise INCOSE membership data by looking at published diversity data for the international engineering community. The approach taken has been to seek reports from two sources:

- Reports on global/international engineering diversity
- Membership data from global/international science/engineering institutions

Global Engineering Population

While consistent global data is not available, UNESCO (2015) notes that women are consistently under-represented in engineering. It does not give an overall global figure. Some national data is available but has not been consistently collected and so may variously refer to quantities of professionally registered women; women members of professional engineering institutions; women in engineering roles; women in scientific roles; female science, technology, engineering, and math (STEM) graduates, to name a few. There is a significant opportunity here for INCOSE to show leadership to add weight to the demand for reliable and accessible global data on gender aspects in engineering, as well as stressing the need to widen this view towards the breadth of diversity data.

Table 8 (next page) shows the INCOSE membership populations for the countries assessed in the "National Membership" section of this paper, together with national engineering data and as a further comparator, the female membership percentage from the IET (2019 data). We have shown the countries with the highest percentage of female INCOSE members at the top of the table. When reviewing this table, readers should note that not all systems engineers are engineers – they come from various backgrounds, so there may be a higher percentage of woman systems engineers than the national engineering percentage.

From this table, you can see that:

- In most cases, INCOSE female membership percentage is similar (within 2%) or higher than the national figure indicating that INCOSE is mostly successful in attracting women in engineering.
- The INCOSE figure is notably lower (more than 2% lower) in China, Sweden, and Germany, with no comparator data identified for India or the Netherlands.
- The INCOSE female membership percentage is equal to or higher than the comparable IET figure for all countries except the Netherlands and India, and globally exceeds IET by some margin (17% versus 9%).

In assembling this table, it was very clear that there is no globally recognised or available source on the engineering gender balance, and what data that does exist is difficult to compare due to differing definitions, methodologies, and validity dates.

Professional Engineering Societies

Professional engineering societies are at the heart of the engineering profession. They set and regulate professional standards, maintain codes of ethics and behaviour, often certify practitioners, and encourage and enable continuing professional development. While across the globe there are varying

Table 8. National chapter individual membership % female members

Nation	INCOSE % women (Jun 2018)	National % women in engineering	IET % women (Mar 2019)	Source of national data
China	35%	40%	32%	Robert 2010
USA (based on Sector I)	19%	12%	4%	Robinson-Bryant and Squires 2018
Italy	19%	20%	3%	Devlin, 2018
South Africa	18%	16%	3%	UNESCO 2015
France (AFIS)	18%	17%	3%	Ismail 2017
Global	17%	11%	9%	World Economic Forum 2017
Israel	13%	14%	0%	UNESCO 2015
India	12%	—	26%	*No national figure found*
Australia	11%	12.4%	5%	Kaspura, 2017
UK	10%	12%	7%	Engineering UK 2018
Sweden	9%	26%	5%	Ismail 2017
Netherlands	8%	—	10%	*No national figure found*
Germany	6%	15%	6%	Ismail 2017

types of society, they broadly have equivalent aims and ways of working.

A recent UK review of engineering societies based in the UK with a total of 600,000 individual members worldwide gave results for gender diversity in both leadership and membership (Royal Academy of Engineering 2017). Twenty organisations responded:

- On average, women make up 13% of engineering society membership. Eight have fewer than 10% female membership, while 11 have more than 11%
- The median percentage of women on the boards of these engineering societies is 31–40%. Nine (out of 20 surveyed) have more than 30% women on their boards.

With approximately 17% female membership, INCOSE is distinctly better than the average for these engineering societies. With 33% female representation on the Board of Directors, INCOSE is in the median band from the survey.

From engagement with key engineering societies and leaders globally as part of developing this paper, we offer the following insights:

- Institute of Electrical and Electronic Engineers (IEEE) has not adopted a formal definition of diversity, but its current efforts focus on gender, regional/geographic diversity, age (young professionals), and technical diversity (including academia vs. industry).
- Institution of Engineering and Technology (IET) has a strong coherent focus on diversity and inclusion, led through a dedicated D&I manager, supported by the IET's chief executive, Senior Leadership Team, and Board of Trustees.
- Institute of Industrial and Systems Engineers (IISE) leadership is developing its Diversity and Inclusion policy at this time, and they will make this public via the IISE website when issued.
- American Society for Engineering Education (ASEE) highlights the need for diversity, equity, and inclusion, and collects biannual data on student enrolments, degree completion, and faculty. The society has a committee on diversity, equity, and inclusion (CDEI) with a representative member from each of the ASEE councils and several divisions.
- Institution of Engineers Australia (IEAust) has recognized definitions of both diversity and inclusion and participates in regular census activities. The role of national manager, professional diversity, and STEM is the focus for activity across the profession in Australia.

Wider Aspects of INCOSE Diversity

The section of this paper entitled "What Do We Mean by Diversity with Respect to INCOSE?" introduced a holistic view of the dimensions of diversity as they relate to INCOSE. While the data collected in the main body of this paper relates mainly to male-female gender balance, this section presents selected anecdotal examples of the other dimensions of diversity within INCOSE:

1. Age/generation: there are several key initiatives addressing younger people within INCOSE such as student divisions, Young INCOSE (the Netherlands), Early Careers Forum (UK), Greatest Young Systems Engineer of the Year (South Africa), the EWLSE mentoring initiative, and a wide range of STEM outreach activities globally.
2. Country/location: from its origin in 1990 as the US National Council on Systems Engineering, INCOSE now has membership in 69 chapters in 35 countries across the world and approximately half the individual membership is now from outside the US.
3. Language: to both share systems expertise and to extend the conversation globally, INCOSE supports the translation of the Systems Engineering Handbook and other technical products from English into other languages and also into English to widen the audience for some products. For example, the Systems Engineering Handbook is already available in Chinese, Korean, and German; the guide to writing requirements is available in Russian; and the guide to product-line systems engineering has been translated from French to English,
4. Sector/business area: the Industry Outreach Board (IOB) and the associated set of domain working groups have accelerated diversity of application domains for systems engineering within INCOSE–from a historic defence/aerospace focus, INCOSE now has active membership

and participation from domains including transportation, automotive, power and energy, healthcare, and infrastructure.
5. Sector/business area: the CAB, INCOSE's voice of the corporate customer, now mirrors INCOSE's geographic and business area diversity and recently has added a membership class to allow very small organisations to join the CAB at an affordable membership fee.

So How Is INCOSE Doing?

Based on its 17% female membership, INCOSE is well-placed when compared to available global and national data, and by comparison with similar engineering societies. There are some countries where female member numbers are lower than the national representation of women in engineering (China, Sweden, and Germany), and two countries where there is no national basis for comparison (India, the Netherlands). The trends to greater female participation in younger and more active membership categories (students, Institute for Technical Leadership, and those attending international events) are positive signs for continued improvement in this area.

INCOSE's current international leadership gender balance of 33% is well within the median in comparison to other societies, and chapter leadership matches the overall membership data. The one area of notable weakness is within Technical Operations where leadership at all levels lags the overall representation of women in INCOSE.

INCOSE Pioneer and Fellows Awards have an under-representation of women historically; however, INCOSE has awarded the Founders Award to women 26% of the time for major contributions to INCOSE. Outstanding Service Awards also lag behind membership at 11% of female recipients.

Looking at the wider aspects of diversity summarised in this paper, INCOSE has clearly been diversifying for some time in a number of dimensions, especially as it has become more geographically global and more inclusive of the various application domains for systems approaches.

So, taken overall, INCOSE is in a reasonable position regarding diversity compared with equivalent engineering societies, with positive trends for the future. There are some areas where INCOSE can make improvements, namely in some countries, in technical operations leadership, and some award categories.

Challenge to INCOSE Leadership

This paper makes the case that systems engineering and INCOSE should be at the forefront of diversity and inclusion in engineering. It has also demonstrated that INCOSE has a decent starting point for this drive as evidenced by the gender balance data and wider diversity factors. This is a real leadership opportunity for INCOSE within the engineering community. This paper recommends that to build on its positive position with respect to diversity:

1. INCOSE should champion the diverse engineering community required to meet 21st century challenges;
2. INCOSE must attract and retain a wide and diverse global membership to maintain and increase its impact and to deliver benefit to members worldwide;
3. And crucially, INCOSE needs access to the best possible range of diverse volunteer talent to advance and promote systems engineering.

There are many ways that INCOSE leadership might choose to advance this agenda, and of course D&I is one of many important perspectives on the future of systems engineering. The authors offer three challenges to the INCOSE Board of Directors:

1. Establish a time-bounded task team to identify what diversity and inclusion means for INCOSE and how INCOSE should develop to be the most inclusive and diverse engineering society in the world;
2. Continue and increase INCOSE's active promotion and championing on diversity and inclusion issues;
3. Review and refine policies, procedures, and structures to ensure that INCOSE is as forward-leaning as possible, removing any unconscious bias to enable and encourage inclusivity across a suitably diverse community. In particular, this should address both Technical Operations leadership and how INCOSE recognises service and achievement. ■

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information diversity. Systems engineers seek organizational endorsement for these ideas and advocate for the required resources and technical effort needed to overcome anticipated challenges. Lastly, systems engineers execute behaviors that create an inclusive environment which allows a functionally and informationally diverse team to overcome the challenges and deliver these innovations, resulting in a competitive advantage. ■

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