

# **Women as Leaders in Systems Engineering**

## **Day 1 Intro Workshop**

**Facilitator: Ann Hodges, Sandia National Labs**

**Assistant: Emily Allen, NMT Student**

### **Participants:**

- |                   |                              |
|-------------------|------------------------------|
| • Mary Compton    | Sandia National Labs         |
| • Rick Dove       | Paradigm Shift International |
| • Kerry Lunney    | Thales Australia             |
| • Joe Marvin      | Prime Solutions Group        |
| • Oscar Mondragon | UTEP Professor               |
| • Tabatha Oria    | UTEP Student                 |
| • Sharissa Young  | Sandia National Labs         |



# Women as Leaders in Systems Engineering

Ann Hodges, SNL Distinguished Member of Technical Staff, CSEP, SAFe SPC4

# Agenda

- Summit summary
- Introductions
- Topic discussion

# Summit Summary: Event Objectives

- Give participants a valued experience of collaborative teaming on a mission
- Expand participant's knowledge of selected systems engineering issues
- Provide participants the opportunity to expand personal networks

# Summit Summary: Workshop as Collaborative Knowledge Development

## Mission:

- Articulate a bounded unresolved problem concisely.
- Identify the Customer(s) that would support a solution
- Identify multi-perspective organizational and cultural impediments to recognizing the problem as one in need of attention and solution.
- Converge on broadly acceptable requirements for an embraceable solution.
- If appropriate, plans for subsequent solution collaborative action.

## Culture:

- Everybody has a voice and perspective that is heard and appreciated.
- Welcoming to all levels of experience (students to elders).
- Everybody engages as a team on a mission.
- Facilitator is there to guide toward mission completion.

# Summit Summary: Day-1 Single-Slide Posters

Three sections (example next page):

1. Articulate the unresolved problem need for resolution.
2. Identify the customer(s) for a solution (provides context).
3. Impediments within the problem area for Day-2 intended focus.

• =====

This Poster will be displayed at the reception, with the intent of enticing participants to attend the Day-2 session.

At the start of the Day-1 intro session the facilitator might suggest a concisely articulated problem statement – for modification or replacement by Day-1 participants.

# Introductions

- Who you are
- You (and your organization's) interest in the topic
- What topic issues you would like to see as a focus

# Rear Admiral Grace Hopper



Nicknamed "Amazing Grace" for her many accomplishments, Grace Hopper (1906 - 1992) was a pioneering computer scientist and a rear admiral in the U.S. Navy. She helped develop the UNIVAC computer, was instrumental in the development of early programming languages such as COBOL, and even coined the term "debugging" after a moth became stuck in the computer's relay.

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# Rachel Carson – “A Silent Spring”



With her 1962 book "Silent Spring," Rachel Carson (1907 - 1964) sounded the alarm about pesticide use – connecting it to the deaths of animals and birds, and even humans – and advocated for much more responsible use of pesticides, especially the then-common DDT.

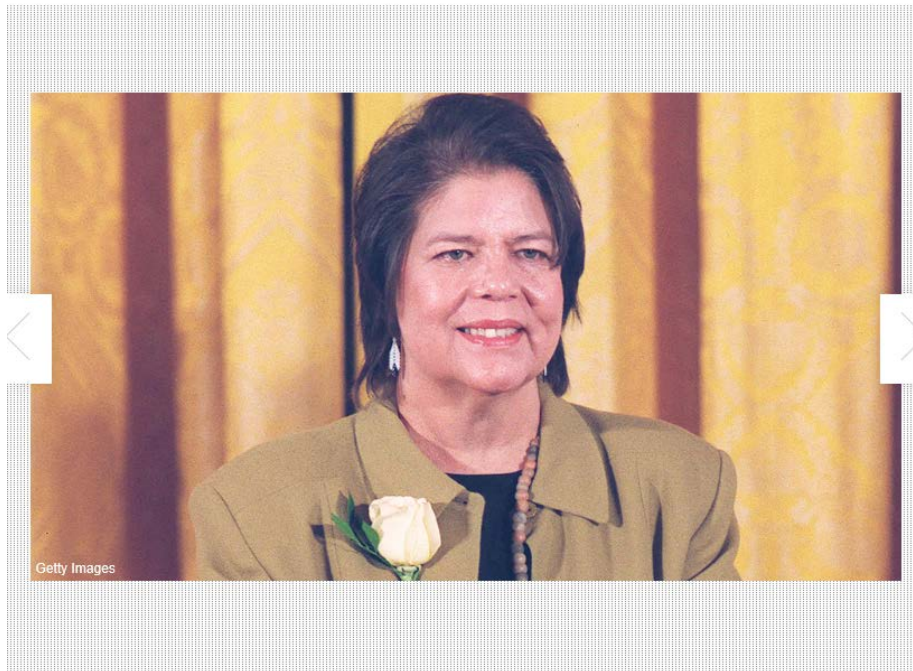
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# Sally Ride – 1<sup>st</sup> woman in space



Sally Ride (1951 - 2012), the first U.S. woman in space – also the youngest American in space – inspired generations of women who were blown away by the pleasant-seeming, normal-looking and completely brilliant and driven young woman who burst onto the national radar in 1983. She broke one of the toughest glass ceilings there was – and American women loved her for it.

# Wilma Mankiller – 1<sup>st</sup> female chief of Cherokee Nation



The first female chief of the Cherokee Nation, Wilma Mankiller (1945 - 2010) and her administration embarked on infrastructure projects, tripled tribal membership and improved relations with the U.S. government. She also authored a national best-selling autobiography, "Mankiller: A Chief and Her People," along with many other books.

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# Rosa Parks – Mother of the Civil Rights Movement



Rosa Parks (1913 - 2005) is affectionately known as the "Mother of the Civil Rights Movement" for refusing to give up her bus seat to a white man, thus sparking the Montgomery, Ala., bus boycott. Not simply a "tired" seamstress, as she is often portrayed, at the time of her civil protest she was secretary of the Montgomery chapter of the NAACP and had recently attended the Highlander Folk School (an education center that focused on racial equality and workers rights).

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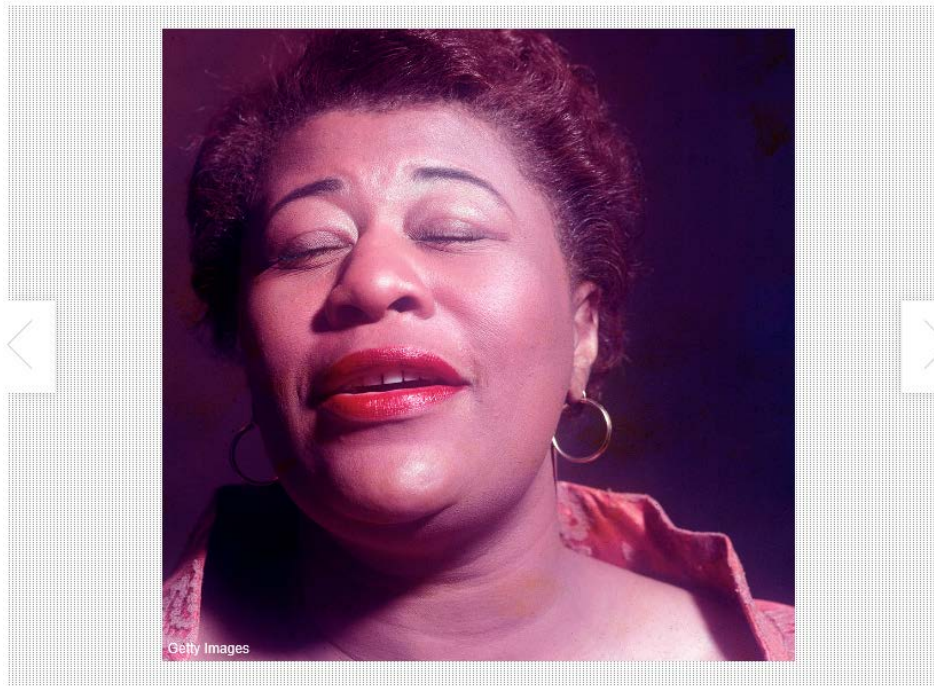
# Shirley Chisholm – 1<sup>st</sup> black woman elected to Congress



An outspoken champion of women and minorities during seven terms in the U.S. House of Representatives, Shirley Chisholm (1924 - 2005) was the first black woman elected to Congress and the first black person to seek a major party's nomination for president of the United States.



# Ella Fitzgerald – 1<sup>st</sup> lady of song



Ella Fitzgerald (1917 - 1996) was known as the "First Lady of Song," the "Queen of Jazz" and "Lady Ella." Her 70-plus albums sold more than 40 million copies and she received numerous awards and honors, including 13 Grammy Awards, the National Medal of Arts and the Presidential Medal of Freedom.

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# Georgia O'Keeffe - mother of American Modernism



Painter Georgia O'Keeffe (1887 - 1986) is widely regarded as the "Mother of American Modernism." Her work first came to the attention of the art community in New York in 1916, and by the mid-1920s she was considered one of the most-important American artists.

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# Helen Keller – challenged perceptions of disabled people

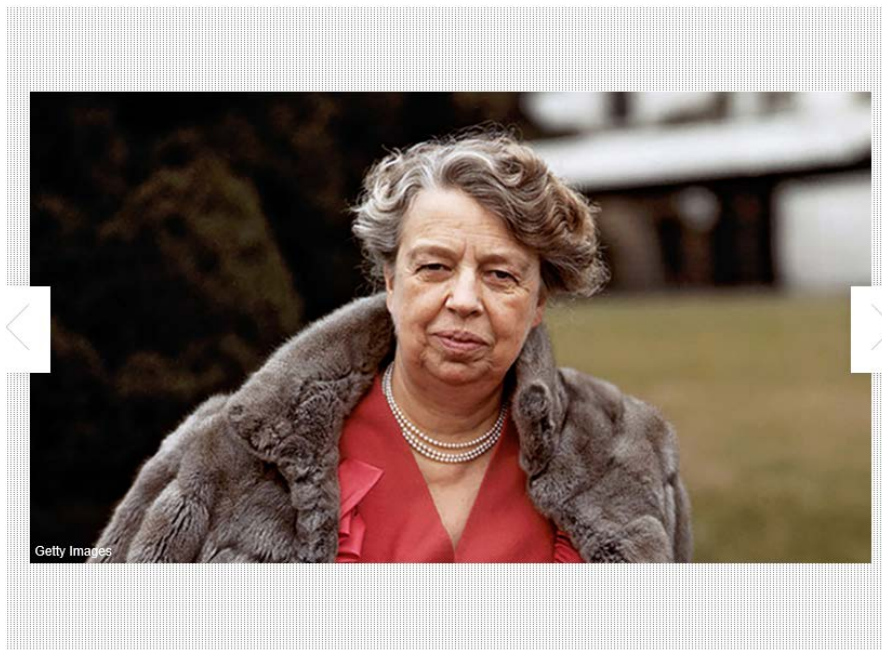


Blind and deaf from the time she was a toddler, Helen Keller (1880 - 1968), seen here with actress Patty Duke (1946 - 2016) who portrayed her on Broadway and film in "The Miracle Worker," overcame many obstacles to change common perceptions of what a person with disabilities could achieve. She remains one of America's most-inspiring women.

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# Eleanor Roosevelt – helped form UN, advance human rights, feminist



Eleanor Roosevelt (1884 - 1962) was one of the most-admired first ladies of all time. She used her enormous influence to help form the United Nations, advance human rights, launch second-wave feminism, and much more.

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# Annie Oakley – 1<sup>st</sup> American female superstar



Annie Oakley (1860 - 1926) was an exhibition shooter who had a starring role in Buffalo Bill's Wild West Show. She is considered the first American female superstar and used her fame to educate other women in the use of firearms for recreation and self-defense.

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# Clara Barton – founder of American Red Cross



"Battlefield Angel" Clara Barton (1821 - 1912) worked on the front lines of the Civil War to tend injured soldiers and maintain Army hospitals. She went on to found the American Red Cross, now one of the largest humanitarian organizations in the U.S.

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Topic discussion

# Women as Leaders in SE – Day 1

## Reception Poster

### Need

- To be more inclusive of women to create strong, effective teams and holistic approaches/solutions.

### Stakeholders

- Employers
- Coworkers
- Men and women in general
- Educators

### Issues

- How women are brought up - environment and opportunities
- Middle school girls drop out of stem
- Media, social constructs influencing children
- Men don't have ally skills
- Providing leadership training and opportunities
- Specific techniques for women
- Having different perceptions of response based of gender
- INCOSE is not very engaged in STEM, STEAM (code.org)
- PATH (philosophy, anthropology, Theater, and History) and how does systems engineering relate to other topics. (Kirby)
- How engineering products relate to social systems
- Assumption of privilege

## **Women as Leaders in Systems Engineering**

### **Day 2 Workshop Results**

#### **Day 2 Participants:**

- |                  |                              |
|------------------|------------------------------|
| • Grisela Acosta | UTEP Student                 |
| • Rick Dove      | Paradigm Shift International |
| • McKenna Gold   | NMT Student                  |
| • Ann Hodges     | Sandia National Labs         |
| • Tabatha Oria   | UTEP Student                 |
| • Tim Wiseley    | Sandia National Labs         |
| • Sharissa Young | Sandia National Labs         |

# Women as Leaders in SE – Day 1

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# Women as Leaders in SE – Day 2

1. Identify organizational and cultural impediments to recognizing the problem as one in need of attention and solution
2. Requirements consensus
3. Plan for subsequent solution and actions



# 1. Organizational and Cultural Impediments

- Cultural patterns are deeply ingrained
  - Women are not seen as leaders by many people including themselves
  - Women can be more critical of other women
  - Women are deferential
  - Lack of promotion of female role models
  - Lack of recognition for women's accomplishments
- Organizational
  - Aren't as many women to choose from, from all levels
  - Men are making the decisions for who becomes the leader
  - Systemic bias and verbiage for leadership opportunities
  - Control, power move
  - Providing opportunities for unqualified people
  - Rules of acceptable interactions are not well understood or if understood followed (political correctness)
  - Women are not given the opportunity of gaining the experience necessary to be promoted (targeted encapsulation)
  - Lack of champions for female promotion

## 2. Requirements Consensus

Requirements	Impediments
<ul style="list-style-type: none"><li>* People need to recognize the deeply ingrained cultural patterns</li><li>* INCOSE shall include gender inclusiveness in the code of ethics</li><li>* We need to develop a compelling value proposition for gender equality and inclusion adding rational and emotional reasons at the organization level and person level</li><li>* INCOSE members need to recognize and document SE accomplishments in the upcoming EWLSE</li><li>* Organizations need to identify and maintain a systems engineering competency model</li><li>* Organizations should utilize an anonymous 360 evaluation for promotions</li></ul>	<ul style="list-style-type: none"><li>● Cultural patterns are deeply ingrained<ul style="list-style-type: none"><li>* Women are not seen as leaders by many people including themselves</li><li>* Women can be more critical of other women</li><li>* Women are deferential</li><li>* Lack of promotion of female role models</li><li>* Lack of recognition for women's accomplishments</li></ul></li><li>● Organizational<ul style="list-style-type: none"><li>* Aren't as many women to choose from, from all levels</li><li>* Men are making the decisions for who becomes the leader</li><li>* Systemic bias and verbiage for leadership opportunities</li><li>* Control, power move</li><li>* Providing opportunities for unqualified people</li><li>* Rules of acceptable interactions are not well understood or if understood followed (political correctness)</li><li>* Women are not given the opportunity of gaining the experience necessary to be promoted (targeted encapsulation)</li><li>Lack of champions for female promotion</li></ul></li></ul>

### 3. Plan for Collaborative Actions

- Further collaboration on development of a compelling value proposition for gender equality and inclusion
- Look for rotational possibilities (including internships and employment) within own organization and check in