

# Assured Autonomy Panel

## Human Systems Integration, Trust



# PANELISTS

- Nancy Cooke (ASU): Importance of HSI for assured autonomy
- Jessie Chen (ARL) Human-autonomy communications, particularly transparency-related human factors issues.
- Missy Cummings (Duke): trust and subjectivity in machine learning practitioners
- Nisar Ahmed (Colorado): uncertainty and competency awareness can inform HSI and autonomous system design, trust
- Matt Johnson (IHMC): interdependence and autonomy roles as challenges and considerations for assured autonomy

*Assured autonomy requires Human Systems  
Integration throughout the lifecycle of systems  
development*

*HSI for autonomy: human-autonomy teaming*

# Robocop Ignores Woman Who Tried to Call Police



# When Human System Integration is Ignored MQ-1/9 Operator Control Station



# HSE Issues with the MQ-1/9 Operator Control Station

Lengthy process to handoff vehicle control

Highly loaded visual channel

Visualization is poor and perpetuates mistakes

Multiple screens require significant mental integration to obtain mission/battlespace awareness

Add-on systems (ie, Falconview) provide needed functionality but cannot interface directly with core GCS

Lack of system feedback regarding task completion

Too many inputs required to implement commands (ex: 22 key strokes to turn on the auto pilot )

Varying methods to input data

Narrow visual field of view

Poor ergonomics

Limited alert cues to warnings where messages can be hidden

Extra workspace required

Multiple keyboard/input devices required

Multiple separate comm devices

Numerous alphanumeric status displays

Non-intuitive multilayered menus

No decision aiding / support technology

# MQ-1/9 Operator Control Station

Industry program officer: “It has been 10 years now since the Predator has been fielded and it might be time to start thinking about human factors.”



# Human Autonomy Teaming Considerations

- *Team members have different roles and responsibilities – do not replicate humans; compose teams based on strengths*
- *Effective teams have team members who are interdependent and thus need to interact/communicate even when direct communication is impossible – some other communication model than natural language*
- *Interpersonal trust is important to human teams – autonomy needs to be mostly reliable and when it is not, explain and exhibit explicable behavior*
- *To get reliable, verifiable Human-Autonomy Teams we need to measure team/system effectiveness*

# CHART: Center for Human, Artificial Intelligence, and Robot Teaming

ASU Global Security Initiative  
Arizona State University

Center for Human, Artificial Intelligence, and Robot Teaming



Technology  
teaming with  
humans for  
global security

CHART assembles multidisciplinary teams to address human-machine integration issues in transportation, emergency response, manufacturing, medicine, and defense.