

# Autonomous Snowplow Competition



**ION North Star Section  
Outreach Program**

**Autonomous Snowplow Committee**



**Preliminary Design Review  
Presentation Information & Outline  
2014 Competitors**

**October 2013**

# PDR Presentation Rules

- PDR presentation slides must follow the provided outline
  - Standardize judging for all Teams
- PDR presentation slides held in confidence until the end of Competition
  - All Team materials may eventually be made public
- PDR presentation slides submission deadline: **Final Version**
  - 9 pm (Central); 7 November 2013 (Thursday)
  - Email submission to Vibhor and Suneel:  
[vibhor.bageshwar@honeywell.com](mailto:vibhor.bageshwar@honeywell.com) & [sheikh@asterlabs.com](mailto:sheikh@asterlabs.com)
    - Please submit a PDF version of the presentation to minimize file size
  - CD submission (not necessary if you email the presentation slides)

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# PDR Presentation Rules

- PDR presentation day: 9 November 2013 (Saturday)
  - Presentation medium: Teleconference call & Screen Sharing
  - ASC Committee will call each Team two minutes before your PDR presentation time
  - Teams should provide a call-in number by 7 November 2013
    - Email call-in number: [vibhor.bageshwar@honeywell.com](mailto:vibhor.bageshwar@honeywell.com)
- PDR presentation time: each Team is allotted 40 minutes
  - Teams provide their 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> choices of time slots starting 28 October 2013 (please see slide 9 for times)
    - Email time selections: [vibhor.bageshwar@honeywell.com](mailto:vibhor.bageshwar@honeywell.com)
    - ASC Committee will make every effort to assign Teams with their first choice
  - First Team presentation begins on 9 November 2013 at 9:00 am (Central)
- *Feedback to Teams will be provided by the Judges during the 40 minute PDR*

# PDR Presentation Rules

- 40 minute presentation time breakdown
  - Student presentation: 20 minutes maximum
  - Q&A with Judges: 5 minutes maximum
  - Judges internal discussion: 5 minutes maximum
  - Team feedback: 10 minutes maximum
- Team scoring and reviews
  - Team scoring will be returned to Team contacts: 16 November 2013
  - Team scores will be updated on website in November 2013
    - [www.autosnowplow.com](http://www.autosnowplow.com)

# PDR Presentation Outline

- Title Slide (1 slide)
  - Team university/name/logo
- Objectives (1 slide)
  - Team objectives
  - Team composition
- Snowplow Vehicle Program Top-Level Requirements (1 slide)
  - Table format
  - ASC Committee hint: a requirement is a metric that indicates when a design satisfies an objective
    - Ex: Navigation system position accuracy: 0.25 m
- Snowplow vehicle plowing strategy (minimum 1 slide)
  - Single “I”
  - Triple “I”

# PDR Presentation Outline

- Snowplow Vehicle Description (please follow the given order)
  - Concept/Plowing strategy (1 slide)
    - ASC Committee hint: address how vehicle will satisfy plowing strategy from a top level
  - Snowplow vehicle design (minimum 1 slide)
    - Snowplow vehicle and blade design
    - Snowplow vehicle physical dimensions
    - Sensor + processor component housing
  - Navigation system design (minimum 1 slide)
    - Concept
    - Sensors
    - Navigation augmentation system
      - Placement of navigation aids in competition field
  - Guidance system design (if applicable) (minimum 1 slide)
    - Way-point selection concept
  - Control system design (minimum 1 slide)
    - Concept & available actuators
    - Bandwidth & actuator response speed
  - Processor & Software design (minimum 1 slide)
    - Timing and action sequence flowchart

# PDR Presentation Outline

- Safety System (1 slide)
  - System description
  - Emergency shut-off options
    - Physical and remote
  - Stopping distance from maximum speed
    - Identify surface
- Failure Modes and Recovery Actions (1 slide)
  - Identify failure mode and recovery actions
  - Table format
- Overall Risk Assessment Summary (1 slide)
  - Evaluate each subsystem
  - Identify known issues
  - Table format

# PDR Presentation Outline

- Vehicle Design Challenges (minimum 1 slide)
  - Highlight vehicle or system design changes from the existing snowplow vehicle design
    - Teams should indicate whether the vehicle or its systems are pre-existing or newly designed
  - Highlight the design challenges the Team will face adapting the vehicle and its systems to this year's competition
- Commercialization and Implementation (2 slides)
  - Identify components and their cost
  - Identify snowplow vehicle and navigation aid cost for sale to the general consumer
    - ASC Committee hint: convey cost to a consumer buying the product at the local hardware store
  - Identify steps consumers would follow to set-up the snowplow vehicle and navigation aids in an operating environment
    - Operating environment example: garage and driveway
  - Identify time to set-up the snowplow vehicle and navigation aids in an operating environment
    - ASC Committee hint: convey the ease or difficulty the consumer would encounter setting up the snowplow vehicle and navigation aids
  - Table format





# PDR Presentation Schedule

Team	Presentation Time (Central)
	9:00 am
	9:45 am
	10:30 am
	11:15 am
	12:00 pm
	1:00 pm
	1:45 pm
	2:30 pm



# PDR Presentation Scoring

- PDR presentation scoring: 5% of the total Competition score

Category	Scoring
Quality of Presentation Slides / Technical Presentation	80
Ability to Engage Audience	20
<b>Total Points</b>	<b>100</b>