

Autonomous Snowplow Competition



**ION North Star Section
Outreach Program**

Autonomous Snowplow Committee



**Preliminary Design Review
Presentation Information & Outline
2013 Competition**

20 October 2012

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 eventually made public
- PDR presentation slides submission deadline: final version
 - 9:00 PM (Central); 18 October 2012 (Thursday)
 - Email submission to Vibhor and Suneel:
vibhor.bageshwar@honeywell.com & 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: 20 October 2012 (Saturday)
 - Presentation medium: conference call
 - ASC Committee will call each Team 2 minutes before your PDR presentation time
 - Teams provide a call-in number by 15 October 2012
 - Email call-in number: vibhor.bageshwar@honeywell.com
- PDR presentation time: each Team is allotted 25 minutes
 - Teams provide their 1st, 2nd, and 3rd choices of time slots starting 15 October 2012 (please see slide 22)
 - Email time selections: vibhor.bageshwar@honeywell.com
 - ASC Committee will make every effort to assign Teams with their first choice
 - First Team presentation begins on 20 October 2012 at 9:00 AM (Central)
 - Presentation time: 20 minutes maximum
 - Q&A time: 5 minutes maximum

PDR Presentation Rules

- Team scoring and reviews
 - Team scoring and reviews will be returned to Team contacts:
10 November 2012
 - Team standings will be updated on website in November 2012
 - www.autosnowplow.com

PDR Presentation Outline

- Title Slide (1 slide)
 - Team university/name/logo
- Objectives (1 slide)
 - Team objectives
 - Snowplow vehicle plowing strategy (1 pass or multiple passes)
 - 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

PDR Presentation Outline

- Snowplow Vehicle Description (please follow the given order)
 - Concept/Plowing strategy (1 slide)
 - Snowplow vehicle design (minimum 1 slide)
 - Snowplow vehicle and blade design
 - Snowplow vehicle physical dimensions
 - Sensor and 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 and available actuators
 - Bandwidth and actuator response speed
 - Processor and 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

- 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 |
| | 9:30 AM |
| | 10:00 AM |
| | 10:45 AM |
| | 11:15 AM |
| | 11:45 AM |
| | 12:30 PM |
| | 1:00 PM |
| | 1:30 PM |



PDR Scoring

- PDR Presentation Scoring: 5% of total Competition Score

| Category | Scoring |
|---|------------|
| Quality of Presentation Slides & Technical Presentation | 80 |
| Ability to Engage Audience | <u>20</u> |
| Total Points | 100 |