

## **Team Instruction for Qualification Inspection Demonstration Event**

Purpose – The Qualification Inspection Demonstration (QID) will verify that participants are in compliance with the DGC rules and, through demonstration, that the vehicles are capable of negotiating the DGC course safely and within the specified 10 hour time limit.

General – All Challenge Vehicles will be inspected, tested and required to demonstrate their ability to navigate safely at the California Motor Speedway. The QID will take place at the California Speedway in Fontana, CA, from Monday to Friday, March 8-12, 2004. Challenge Vehicles must pass the QID to compete for the \$1M prize in the DGC field event on Saturday, March 13<sup>th</sup>, 2004.

Each team will accomplish two demonstration runs at the QID. To establish the QID start sequence a drawing will be conducted on 16 January 2004 from 1300 to 1500 (1PM to 3PM EST or 10 AM to 12PM PST) in Washington DC. The drawing will establish the Team's QID "pole position" which will also be the entrants' Event "vehicle number." It also determines the technical inspection time and demonstration run sequence. We recommend that the Teams participate in the drawing by calling 1-800-869-6600 (operator assisted). DARPA will chair the conference call and conduct the drawing. All conference call participants will be recorded.

At the QID, each Challenge Vehicle shall undergo a 30 min physical inspection to verify that Challenge Vehicles are the same vehicles as described in the team's technical paper and that the vehicle complies with the DGC rules. If there are any changes to the team's technical paper submitted in Oct 2003, the team's updated technical paper must be received by DARPA by 1 March 04. .

At the QID, each vehicle will also negotiate a one and a half mile course where the E-stop and tracking system will be tested for proper integration and operation and the vehicle's cross-country capabilities, navigation, sensing and control systems will be assessed. Any vehicle posing a safety or environmental threat will be disqualified.. All QID qualified vehicles will be transported to the entry point of the field test phase on Friday, March 12, 2004.

### Schedule of Events:

#### March 7 - Speedway:

7:00 – 9:00 PM - Team Registration and in-processing at the Speedway.

The teams challenge vehicle pit area available

9:00-10:00 PM - Team QID Briefing – Team Captains and Representatives must be present

#### March 8 - Speedway:

7:30AM – 5:00 PM - Team Registration and in-processing at the Speedway Continued

9:00 AM - Judges begin Technical Inspections (all vehicles will be inspected on Monday)

1:00 PM - Track demonstrations begin, one every half hour

5:00 PM - Track demonstrations cease

10:00 PM - Garage Area and Speedway are closed and secured

March 9-11 - Speedway

7:00 AM - The Speedway and Garage area is opened

9:00 AM - Technical Inspections and Track Demonstrations resume

5:00 PM - Technical Inspections and Track Demonstrations cease

10:00 PM - Garage area and Speedway are closed and secured

March 12 - Speedway:

7:00 AM - The Speedway and Garage areas are opened

9:00 AM - Technical Inspections and Track Demonstrations resume

12:00 PM - Qualified teams are released to move Challenge Vehicles to DGC Start area

2:00 PM - Technical Inspections and Track Demonstrations cease

3:00 PM - All teams must exit the Speedway

5:00 PM - Garage area and Speedway are closed

March 13 The DARPA Grand Challenge Field Test Starting Point

## Security and Safety

**Registration:** All staff, Team Members and Distinguished visitors must pre-register through the DGC registration website. Wristbands and parking passes will be issued to pre-registered team members at DGC Registration office located in the Speedway Credential Building from 7:00-9:00pm on Sunday and 7:00-5:00 pm on Monday. Recipients must first show valid government issued identification (driver's license) and provide signed liability waiver before wristband will be issued. Teams may begin to pre-register at the DGC registration website beginning January 16, 2004. Team leaders will be required to download the liability waiver from the DGC registration website beginning January 16, 2004.

**Access control:** Access to the garage area and the track areas will be strictly controlled. Team members have access to the garage area and spectator areas when they are open. Spectators and Distinguished visitors have access to spectator areas only, from 9-5 daily unless escorted by a DARPA staff member with appropriate access. Team members are restricted to their area and are not allowed into other team's area without permission. Media will have full access to all track areas except the track surface or areas designated off-limits unless escorted by a DARPA staff member with appropriate access. Only Judges and Track Operators have full access to the track surface. TEAMS ARE

RESPONSIBLE FOR SAFEGUARDING THEIR CHALLENGE VEHICLE WHENEVER THE GARAGE AREA IS OPEN. After hours the garages and the garage area will be locked and guarded by Government and Speedway security personnel.

Parking and Traffic Flow: Once teams pick up their wristbands and parking passes (new – parking passes) they will be directed to the garage area. Teams will park their Challenge Vehicle within the assigned garage and park any ancillary equipment in nearby parking spaces. Only vehicles with Garage access parking permits will be allowed to enter the garage area.

Liability Waivers: All persons entering the Track surface and the garage/pit area must have a signed liability waiver on file with the DGC Registration Office. [Any one under 18 years of age, must have a parent or guardian co-sign the waiver.](#) If parents/guardians will not be present the form must be notarized verifying the parent's ID and signature. Liability Waiver Forms will be available for download on the DGC Registration Website on 16 January.

## The QID Process

Specific times that teams will be required to render their entry Challenge Vehicle for technical inspection and for track demonstration will be determined by Friday January 16 by means of a drawing. Each team will be supplied with the QID Route Definition Data Files two hours prior to their appointed start time.

Technical Inspections – Two three-person DARPA teams will conduct technical inspections of Challenge Vehicles starting at 9:00 AM on Monday, March 8, 2003. Teams will be required to have their Challenge Vehicle at the technical inspection bay at their appointed time. The inspectors will verify that the Challenge Vehicles comply with the rules of the DGC and that the Challenge Vehicles are built as described in the team's technical paper.

The Demonstration Track Que – Teams must move their Challenge Vehicle to the track queue one hour prior to their appointed track start time. A queue monitor will guide teams to the track que and ensure they are in the proper order.

The Start Line – On the direction of the Start Judge, teams will move their Challenge Vehicle to the start line pointing the vehicle down the track to the next navigation point. On the direction of the Start Judge, the team will start their Challenge Vehicle. Once started, DARPA will have complete control over the Challenge Vehicle, including the ability to start and stop navigation and operation of the vehicle at any time. At the start position, prior to being released to negotiate the track, the Judges will conduct a series of tests to ensure that the E-stop is properly communicating and the the warning devices and tracking system are operational. DARPA will provide a technician to troubleshoot the E-Stop and Tracking Device, if needed. If the cause of failure cannot be corrected in

a reasonable amount of time (approx 10 minutes), the Challenge Vehicle will be taken off the course and rescheduled at no penalty.

The QID Track – Once released, the Challenge Vehicle will be unmanned and autonomously negotiate the 1 ½ mile course. The course layout is both on and off the Speedway track surfaces. Vehicles will navigate from point to point (waypoint) as defined in a computer file (route definition data file, RDDF) that identifies the route to be followed and other navigational parameters. The computer file also defines the width of each road segment that the vehicle is able to operate within between waypoints. The route may be as wide as 90 feet and as narrow as 10 feet with speeds that range from 5 mph to unlimited speeds. In open areas, the widths may be much greater, allowing vehicles to determine their own route and evaluate the best way to get between two waypoints. The computer file defines speed limits for each route segment. Much of the course includes road hazards, such as stopped cars and rough terrain features that must be safely negotiated. Among the possible terrain features are hills, ditches, sand, cattle guards, washboards and overpasses (see attached diagrams).

Finish Line – At the conclusion of the course, the Challenge Vehicles will be stopped in a chute where a government team will read and extract data from the E-stop device. Once the government team completes their work, they will relinquish control of the Challenge Vehicle to team members.

Scoring – The Challenge Vehicles will be scored on their ability to negotiate the QID course; stay on the course without violating the lateral boundaries, stay within the speeds specified in the RDDF, and avoid hitting objects like barriers, overpasses, cars and towers.

Track Time – The time that it takes a Challenge Vehicle to traverse the QID course will be a factor in determining the order of the Challenge Vehicles for the start of the DGC. We have allowed 30 minutes to complete the course for each demonstration run. Generally, the faster and higher scoring Challenge Vehicles will be allowed to start the DGC Event first.

Qualification Runs: Each team will accomplish two demonstration runs at the QID. Qualification for the 13 Mar 04 field exercise event will be determined following the second demonstration run.

Challenge Vehicle Impoundment and Display – Upon successful qualification, the team's Challenge Vehicle may be impounded by the government. Following qualification, the teams may place their Challenge Vehicle in the static display area for public viewing during the day. In the evening, the qualified Challenge Vehicles will be secured in a garage separate from non-qualified Challenge Vehicles and secured by government personnel. While impounded, teams will be allowed to make changes to the vehicle's configuration only if a Government representative is present.

Movement to DGC Start Area – On Friday morning, March 12, no earlier than 12:00 noon, and no later than 3:00 PM, QID qualified teams will move their Challenge Vehicles to the DGC start area with government presence and/or escort.

Food – Food and beverages may not be brought into the California Speedway as specified in the agreement between the DGC and the Speedway management. The concession stands inside the Speedway will be open Monday thru Friday from 9 am until 5 pm each day. Any additional catering desired should be coordinated through Americrown, the official caterer of the California Speedway. If you would like information on arranging catered events, please contact Brandy Escamilla at Americrown at (909) 429-5371.

Hotels – Team hotel room blocks are in the process of being finalized. The hotel information will be available on the DGC Registration website after January 16, 2003.

Radio Communications – Teams may use hand held radios to communicate amongst the team, however, they must coordinate with the QID Operations Center to prevent interfering with the QID communications network. Teams may use cell phones without restriction. The local spectrum will be monitored for unauthorized transmissions.