

## Informativo 04

Salvador, August 4th, 2020

Dear Participants,

The Design Evaluations will be broken down in different events, this informative refers only to Deliverables.

All deliveries must be written in English. Any document delivered partially or totally in a language other than English will have a 30% deduction from their score.

### Design Validation

The Design Evaluation will have partial deliveries throughout the year. All the reports we ask should already be part of the team activities and should not add to the team workload.

All details regarding templates, subjects to be covered, scores, penalties, submission and further clarification are described within this document.

The goal is to have a closer look on the team's work and evolution throughout the year, encouraging continuous learning and improvement as well as to identify coherence between targets/goals and achieved results.

### Scores and Penalties

This part of Design Evaluations has a score of 100 points.

Delays in file submission will not be accepted; the teams are strongly advised to submit all documents hours before the deadline. Any document submitted by any team which does not meet the deadline will be disregarded and will be assigned a score of zero (0).

### Deliverables

This section is meant to describe all deliverables, what is expected for each of them, how many points each is worth, and how each may be penalized.

Each deliverable has a specific date and time for submission; Delays will not be accepted.

- **Deliverable 1 – due date: Aug 28th, 2020**
  - Issues at 2020 competition (5 pts):
    - Issue Description: Teams are required to present the two main issues faced at the 2020 National event with the highest impact on result, one vehicle failure and the other a team issue (if the team was not in the competition or failed to pass safety inspection this should be main team issue);
    - Root Cause: Present which was the root cause which led this failure to happen. Show methodology and steps to reach presented cause;
    - Permanent Correction: How did the team permanently fixed the issue, show solution robustness;
    - Prevent Recurrence: How the lessons learned will be passed on to make sure the issues do not happen again in the future.
  - Targets and Goals for 2021 Northeast competition (15 pts):
    - Each team needs to submit the following list of vehicle targets and goals:
      - Time for 0-30m of acceleration (s);
      - 100 m Final Speed from rest (Km/h);
      - Traction Capacity (N);
      - Turn Radius (mm);
      - Braking Distance (mm);
      - Width (mm);
      - Wheelbase (mm);
      - Total Weight (Kg);
      - Ground clearance without driver (mm);
      - Prototype allocated budget (R\$);
    - Each team will start with 15 points and will lose 1.5 points for each undelivered item.
    - If there are targets/goals changes through the project, the teams are allowed to submit a new file to replace an old one, penalty will be 0.5 point + 0.1 point per month to be deducted from **Delivery 4**.
  - Project Management Plan (10 pts):
    - Each team is required to deliver the timing plan for its vehicle. This timing plan should be built in a way that the team understands and presents all important events and milestones for the vehicle design and manufacture, tasks already completed by Aug 28th should also be on the timing plan and compared to the initial plan; The timing plan must be delivered as an attachment, in PDF format;
    - 5 pages maximum.

- **Deliverable 2 – due date: Sep 18th, 2020**
  - Virtual Validation Report (30 pts):
    - Each team is required to report 3 validation studies;
    - The first study shall be based on the vehicle failure described on the **Deliverable 1**;
    - The second study will describe the design, manufacturing, set up and validation of the brakes system, plus the calculus or simulation to demonstrate the vehicle braking capacity (MFDD [mean fully developed deceleration] and stopping distance);
    - Third study must present kinematics and dynamics of suspension systems, including graphs for Toe and Camber on the suspension travel. Response to a dynamic condition are also expected, for example, fall from a given height;
    - All studies should contain input information, assumptions considered, output data and any other information considered important to understand the results;
    - When applicable, present: Boundary conditions, mesh, solver, post processing, fatigue, tests used as input, off-the-shelf components selection, etc.
    - The final report, including all validation studies, must have up to 4 pages in length (maximum size).
  - Virtual Validation Plan (10 pts)
    - Each team is required to submit the virtual validation plan briefly describing which activities will be performed to ensure the vehicle has achieved its performance and durability targets.
- **Deliverable 3 – Due date: Oct 16, 2020**
  - Project modifications in progress (10 pts):
    - Teams must present 3 major project modifications to the current vehicle project. Modifications can be in any system. Each one must be technically justified. Virtual simulations can be used to complete the justification. These modifications should be compared with the 2019 vehicle, therefore plots and images confronting 2019 with 2020 design are expected. New teams developing their first prototype should compare their initial iteration with the latest design concept instead.

- **Deliverable 4 – Due date: Oct 30, 2020**
  - Technical Specification Sheet (TSS)
    - Same sheet as sent on previous years, the template will be informed in the next section;
  - Virtual Test Results and Reports (20 pts):
    - On this section teams are requested to provide all virtual test results to verify if they have achieved the target established on **Deliverable 1**, the numbers will be verified, and the penalties will be applied as below:
      - 0% to 5% deviation: no penalties;
      - 5% to 10% deviation: for every 1% above 5% mark the team will lose 4% points from its score, the teams are allowed to justify the reason for the target not to be achieved, if accepted 2% will be lost instead;
      - Deviation above 10%: The team will lose 5% for every 1% above 5% deviation. No justification will be accepted;
      - Show virtual testing targets evidence, otherwise the results will not be considered;
      - For each undelivered test report 5 points will be deducted as penalty;
      - The deductions will be applied for each item, no negative points will be awarded.
- **Deliverable 5 – Due date: On a further informative**
  - Deliverable 5 information will be part of a further informative.

## Template

A specific informative will be released for deliverables template, which should work as format guide, however slight changes are acceptable.

For every submission the team should submit a DOCX and a PDF of the complete deliverables template, even if the next deliverables remain blank; for deliverables 2, 3 and 4 the previous pages already sent should be resent unchanged, in the event of targets update a new submission date should be informed and penalties will be applied as described on **Deliverable 1** section. If the team changes the previous deliverables content without informing the changes, the Design Validation score will be 0.

The templates to be used in the **Technical Specification Sheet** are the same templates used in the International Competition, which can be accessed through the link below:

- Technical Specification Sheet: <https://drive.google.com/file/d/12TB0d-RK7M8vyfhctZQn7UgHIZUwXhup/view?usp=sharing>
- No change is allowed.

## Dates and times for files delivery

The design evaluations files should be delivered following the dates below:

### Design Validation (Delays will NOT be accepted):

- Deliverable 1 – Aug 28th, 2020 up to 13h59min (Brasilia time);
- Deliverable 2 – Sep 18th, 2020 up to 13h59min (Brasilia time);
- Deliverable 3 – Oct 16th, 2020 up to 13h59min (Brasilia time);
- Deliverable 4 – Oct 30th, 2020 up to 13h59min (Brasilia time);
- Deliverable 5 – TBD (Brasilia time);

## Submission procedure

Due to documents sizing, there will be two different submission procedures.

### Design Validation

Deliverables submission will be made through email ([bajasaene@gmail.com](mailto:bajasaene@gmail.com)). The deliverables should be submitted by the teams as a single document in DOCX and PDF format (except for **Deliverable 4** in which the team will also submit the TSS, and **Deliverable 1** where the schedule can be sent in PDF format), following the standard title below:

### **BNE20 – Deliverable X – Car ## – Team YYYYYY**

The teams are allowed to update the files by making new uploads until the deadline, only the latest submission will be considered as official and the appropriate penalties will be applied.

For large files which can't be attached to an email, the file can be uploaded to Google Drive (no other way will be accepted) and the generated links should be sent to the committee through email meeting the deadlines.

## ***Baja SAE Brazil – Northeast Event Committee***