



DEPARTMENT OF MECHANICAL ENGINEERING

GUEST LECTURE

A Guest lecture was delivered through **online(webex)** on 15/08/2020 to B.Tech Final year students and Faculty of Mechanical Engineering Department, Time : 12 pm to 1.00 pm topic on “Accepted practices in FEA” by Industry Expert Mr.S.S.Subramanya sastry (Renprotech Soln. Pvt. Ltd.)Hon. Chairman, Composites Working Group, NAFEMS (India)

He talked about

- Checklist before starting the analysis
- Important features to be captured and satisfactory prediction of the behaviour structure
- Importance of checklists in a production finite element analysis
- Importance of Excel templates
- Points to be practiced during reporting stage
- Points well known but ignored

WEBEX Link:

<https://kluniversity.webex.com/kluniversity/j.php?MTID=mf0c376aabb74fc3e3de37362d70a33ff>

Some Glimses of Guest Lecture

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Accepted Finite Element practices

Title: Accepted practices in practical finite element analysis of structures

Presenter name: S S Subramanya Sastry, F.I.E., F.I.I.P.E.

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Accepted Finite Element practices

4. Understanding of the various standard codes of compliance at least in course of time if not immediately. Eg.,
 1. Read and understand all the applicable airworthiness standards/documents like CS (Certification Specifications) / JAR / FAR
5. Use standard reference books such as Bruhn/Niu/Peterson immediately accessible for all simple analytical calculations for checking FEA results.

Participants (41)

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Accepted Finite Element practices Element Quality Parameters

- ❖ Jacobian is a measure of deviation of an element from an ideally shaped element (Jacobian is a matrix relating derivative of a variable in one co-ordinate system to the derivative of the same variable in another system).
- ❖ In order that the value of the result be same in both the co-ordinate systems J must be 1.0
- ❖ The Jacobian value ranges from 0.0 to 1.0, where 1.0 represents a perfectly shaped element and 0.0 represents a worse shaped element.
- ❖ Jacobian of 0.7 (HM) and above is acceptable.

Participants (46)

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Accepted Finite Element practices (Modeling: Element core)

❖ Regions where additional prepreg layers are given, core thickness will be reduced in order to have uniform thickness for entire panel.

The diagram illustrates a sandwich panel cross-section with the following components and labels:

- Shell Element normal direction:** Indicated by a red arrow pointing upwards.
- Neutral Axis where the panel is meshed with shell elements:** A horizontal dashed line through the center of the panel.
- Ply ID 7, Ply ID 6, Ply ID 5, Ply ID 4, Ply ID 3, Ply ID 2, Ply ID 1:** Labels for the various prepreg layers on both the top and bottom surfaces.
- Property P1 with 7 layers with ply ids 1 to 7:** A region on the left side of the panel.
- Property P2 with 4 layers with ply ids 1,3,4,5 and 7:** A region on the right side of the panel.
- Core of lower thickness:** A label pointing to the core material in the Property P2 region.

Demonstration of usage of crushed core technology

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