

THE INSTITUTION OF MECHANICAL ENGINEERS

North East Asia Region Design Competition for Stroke Patients

Competition Rules
Update 2 Revision 1

NEAR DCSS Work Group
[Updated 28 May 2014]

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Part A: Administrative Regulations

Article 1: IMechE North East Asia Region Design Competition for the Sufferers of Stroke (NEAR DCSS) Overview

The Design Competition for the Sufferers of Stroke (DCSS) invites participants to use their talent and creative thinking to design and prototype an innovative solution to problems faced by the sufferers of stroke.

A1.1 IMechE NEAR DCSS Programme Objective

IMechE NEAR DCSS is a cross-region engineering design competition for university students. The objective of the competition is to simulate real-world engineering design projects and their related challenges. Each team compete to have its design accepted for production. The competitors must function as a team to design and promote their ideas, and then they must build, test and compete with a functional prototype within the limits of the rules.

A1.2 Design Subject

Each team's goal is use their talent and creative thinking to design and prototype an innovative solution which would help a stroke patient to perform everyday tasks as a normal person would do. The solution and prototype should aspire to be innovative and fundamentally improve the ability of a person who suffers from stroke.

Article 2: IMechE NEAR DCSS Format

A2.1 Qualified Entries

IMechE NEAR DCSS is open to all student chapters (one entry per student chapter) in the North East Asia Region.

A2.2 Official Announcements and Competition Information

Teams are required to read the articles posted on the IMechE NEAR DCSS website. Teams should be familiar with all official announcements concerning the competitions and rule interpretations released by IMechE NEAR DCSS Work Group.

A2.3 Official Language

The official language of IMechE NEAR DCSS is English. Document submissions, presentations and discussions shall be in English at all stages of the competition.

Article 3: Participant Requirements

A3.1 Eligibility Limits

Each student chapter is limited to one (1) entry. Participants shall not have working experience in the engineering field for more than ten (10) years.

A3.1.1 Eligibility for Non-Student Chapter Entrants

For university entrants without a student chapter, they are eligible to compete as long as they belong to an IMechE regional branch or cluster. In that case, the regional branch or cluster leader will be notified to provide facilitation if necessary.

A3.2. Eligibility for Young Engineers

For non-student entrants, all members shall not have working experience in the engineering field for more than ten (10) years. The team shall follow all requirements except Article 4 Team Advisor. The first member on the application form is the nominated team leader, and may use his/her contact address as the address for the team.

A3.3 Society Membership

All participating team members **MUST** be either an Affiliate or Associate Member of IMechE. **Members are not allowed.**

Article 4: Team Advisor

A4.1 Team Advisor Status

Each university team may have a Faculty Advisor if so desired. The Team Advisor is expected to accompany the team to the competition and will be considered by competition officials to be the official team representative. Otherwise, the team shall have a leader to act as the team representative.

A4.2 Responsibilities

Team Advisors are expected to advise their teams on general engineering and engineering project management theory.

A4.3 Limitations

Team advisors **may not** design any part of the prototype nor directly participate in the development of any documentation or presentation.

Team Advisors **may neither fabricate nor assembly** any components nor assist in preparation, maintenance, testing or operation of the prototype.

Team Advisors are **not allowed to participate** during (technical inspection or) design presentations.

In brief: Team Advisors may not design, build or repair any part of the prototype.

Article 5: Registration

A5.1 Registration details

All registration for IMechE NEAR DCSS must be lodged with NEAR DCSS Work Group Champion at (NEAsiaDC@imechenetwork.org).

A5.2 Entries per Student Chapter (University)

Only one entry per Student Chapter (University) is permitted.

A5.3 Registration Limit

The maximum number of members in each team is five (5) individuals.

A5.4 Registration Dates

The deadline for enrolment is **6th June 2014**.

A5.5 Submission of Regional Preliminary Competition Entries

The deadline for regional preliminary competition entry submission is **18th July 2014**.

A5.6 Withdrawals

Registered teams that find that they will not be able to attend the competition are requested to officially withdraw by notifying the following no later than (2) weeks before the submission deadline (4th July 2014).

Article 6: Prizes

The prizes for the DCSS that will be awarded are as follows:

| Name of Prizes | No. | Prize |
|--|-------------|---------------|
| Following prizes nominated by Judging Panel | | |
| Champion | 1 | Trophy + £500 |
| First runner-up | 1 | Trophy + £300 |
| Second runner-up | 1 | Trophy + £100 |
| Following prize by public vote | | |
| Most popular | 1 | Trophy + £200 |
| Following prize awarded to all finalists | | |
| Merit awards | 10 (max) | Certificates |

Article 7: Questions on Rules

A7.1 Questions

By submitting a question to IMechE NEAR DCSS, you and your team agree that both your question and the Work Group's response can be reproduced and distributed by NEAR, in both complete and edited versions, in any medium or format within the IMechE network.

A7.2 Question Types

The IMechE NEAR DCSS Work Group will answer only questions that are not answered in the rules or FAQs or that require new or novel rules interpretations. The Work Group will not respond to questions that are already answered in the rules.

A7.3 Question Submission

Questions should be submitted via email: NEAsiaDC@imechenetwork.org

A7.4 Response Time

Please allow a minimum of 5 working days for a response. The NEAR DCSS Work Group will respond as quickly as possible. However, responses to questions presenting new issues, or of unusual complexity, may take longer.

PART B: Technical Requirements

Article 1: General Design Requirements

B1.1 Definition of Sufferers of Stroke

According to the World Health Organization (WHO), stroke is known as cerebrovascular accident, in which the interruption of the blood supply to the brain has cut off the supply of oxygen and nutrients, causing damage to the brain tissue.

The classifications of stroke include:

- Ischemic
- Hemorrhagic

For detailed definition, please visit:

http://www.who.int/topics/cerebrovascular_accident/en/

The proposed design is intended at improving the lives of stroke victims in any way possible. The prototype may help either or all classification of stroke patients.

B1.2 Design Requirement

There are no technical restrictions to the form and function of the design as long as it is not directly developed from an established product or a purchasable design.

The projected production cost of the proposed design is required to be below US\$100.0 for affordability reason.

B1.2.1 Design Size and Budget

Teams which are selected for the finals shall produce a fully functional prototype for the demonstration of their design to the judging panel and the public. Where a full scale prototype is not practical, the teams may use computer animation video plus a full set of production drawings to demonstrate the functionalities of the proposed design for evaluation.

PART C: Regional Preliminary Competitions

For regional Preliminary competitions, the teams must produce a design proposal. The submitted proposals will be judged by a panel of IMechE NEAR volunteers and HQs staff member and the winners of the Region Preliminary Design Competition will be invited to the final competition.

It is envisaged to have to a maximum of ten (10) to twelve (12) entries to compete in the NEAR DCSS Final in Beijing.

Article 1: Design Proposal

C1.1 Content

The design proposal shall include part or all of the following:

- Executive Summary
- Problem Statement
- Project Brief
- Specification
- Development and Final Design
- Business Plan and Feasibility
- Prototyping Plan

The design proposal should be no longer than 10 pages in length.

C1.2 Executive Summary

The executive summary shall be no longer than 1 page in length, and should summarise the key items of the entire design proposal. The executive summary should be understandable as a standalone document.

C1.3 Problem Statement

The problem statement should clearly identify the problem that the design aims to resolve.

C1.4 Project Brief

The project brief is a short statement stating the target outcomes of the design.

C1.5 Specification

The specification should describe measurable requirements to be satisfied by the design, and should be considered as a tool to aid the teams in developing their designs.

C1.6 Development and Final Design

The design proposal shall include the development of the concept(s), and how the final design resolves the specified problem. It is encouraged that relevant visualisations (i.e.

sketches, drawings, flow diagrams, etc.) of the design in development and the final design be included.

C1.7 Business Plan and Feasibility

As the proposed design is supposed to be marketable, the report shall explain the design's key competitive advantages. The estimated cost for manufacturing or providing the design to the market should also be included. The team may give outline of the product's marketing strategy to make it a potentially successful commercial product.

C1.8 Prototyping Plan

The report shall include how the prototype can be produced, the engineering drawings sufficient for manufacturers to product the prototype, and the total budget for prototyping.

C1.9 Submission format of the Report

Each team must produce a hardcopy of the report upon submission. Each team must also submit a softcopy of the report in Adobe Portable Document Format (*.pdf) or Microsoft Word (*.doc, *.docx) format. Additional multimedia content on the softcopy is accepted.

Article 2: Judging Criteria

| Category | Weight |
|---------------------------------|---------------|
| Design/innovation | 30% |
| Engineering/practicality | 30% |
| Business Feasibility | 20% |
| Quality of submission | 20% |
| Total | 100% |

Article 3: Judging Panel (preliminaries)

The judging panel for the Preliminaries shall include the following:

| Members | Nominated |
|---|------------------|
| Design Contest Work Group Representative | |
| IMechE Headquarters Representative | |
| Three judges from North East Asia Region volunteers and the related associations | |

PART D: Final Competition

Up to ten (10) to twelve (12) finalists will be selected to compete in Beijing on (date TBC).

Article 1: Attending the Final Competition

D1.1: Eligible Members to Participate

The maximum allowed number of members to attend the Final Competition is five (5) per team.

The Finalists are required to prepare a prototype of the design, a presentation, and public display which includes live demonstration of the working prototype.

D1.2 Presentation

Finalists are required to make a twenty (20) minutes presentation of their design to a panel of judges (See Judging Panel (Finals)). One or more team members may make the presentation to the judges.

Following the presentation there will be **no longer than** ten (10) minutes for questions from the judges.

Only the judges are permitted to ask questions. Any team member on the presentation floor may answer the questions even if that the member did not speak during the presentation itself.

The presentation will be conducted in English only.

D1.3 Prototype

Finalists are required to produce a prototype of their design for demonstration to the panel of judges and for public display. The quality and ability of the prototype to demonstrate the function of the design will be judged.

The prototype and associated documentation must be conceived, designed and fabricated by the team members without direct involvement from other professional engineers, school/university staff or professionals in outside communities.

Where it is not feasible for teams to produce specific components, teams are permitted to outsource the manufacture of such components.

Teams are not allowed to outsource the production of the entire design, and must assemble all externally manufactured components themselves. Teams are also prohibited to use or develop a manufactured product which is already a device which helps visually impaired persons.

D1.4 Reimbursement for Prototype

Teams will be reimbursed for actual expenses on prototyping their designs up to a maximum of US\$100.0. Reimbursement will be dispensed only upon submission of a record of expenditures along with original receipts during the Finals held in Beijing.

D1.5 Public Display

Finalists are required to setup a display at booths provided at the competition venue and to explain and demonstrate their designs to the visitors which will include members of the public and invited sufferers of stroke. The “Most Popular” award will be by public vote, open to all visitors to the competition venue.

Article 2: Final Competition Presentation

D2.1 Judging Criteria

| Category | Weight |
|--------------------------------|---------------|
| Design (Innovation) | 30% |
| Engineering | |
| Quality of Prototype | 10% |
| Engineering Principles | 20% |
| Business Feasibility | 10% |
| Quality of Presentation | 15% |
| Public Vote | 15% |
| Total | 100% |

D2.2 Judging Panel (Finals) (TBC)

One or more team members may make the presentation to the judges.

The judging panel for the Finals shall be as follows:

| Members | Nominated |
|--|------------------|
| Design Contest Work Group Representative | |
| IMechE Headquarters Representative | |
| NEAR Representative | |
| Representatives from local institutions and organisations serving the sufferers of stroke | |