The Science and Engineering Challenge Handbook

Supported by many Australian Rotary Districts

Contents

University of Newcastle Challenge team

Dr Terry Burns
Director and Team Leader (Orange)
P: (02) 4921 5434
F: (02) 4921 8694
M: 0418 653 699
E: Terry.Burns@newcastle.edu.au

Peter Fullagar
Team Leader (Red)
P: (02) 4921 6551
F: (02) 4921 8694
M: 0418 407 322
E: Peter.Fullagar@newcastle.edu.au

Chris Hendry
Team Leader (Blue)
P: (02) 4921 7993
F: (02) 4921 8694
M: 0429 777 910
E: Christopher.Hendry@newcastle.edu.au

Jess Kearney
Team Leader (Yellow)
P: (02) 4921 7967
F: (02) 4921 8694
M: 0409 449 151
E: Jessica.Kearney@newcastle.edu.au

Luke Roberts
Team Leader (Teacher intern)
Luke.Roberts@newcastle.edu.au

Michael Cassey
Events Manager
P: (02) 4921 7319
F: (02) 4921 8694
E: Michael.Cassey@newcastle.edu.au

Neville Want
Challenge Technician
P: (02) 4921 7968
F: (02) 4921 8694
E: Neville.Want@newcastle.edu.au

Carly Donohue
Education Officer and Team Leader
0448 971 846
Carlene.Donohue@newcastle.edu.au

Jodie Ryan
Development Officer
(02) 4921 5071
Jodie.Ryan@newcastle.edu.au

Why we exist

The Science and Engineering Challenge (The Challenge) is an outreach program aimed at changing students' perceptions of science and engineering. Through the Challenge, students experience aspects of these disciplines which they would not usually see in their local school environment. The Challenge aims to inspire students in Year 10 (and below) to consider a future career in science and engineering by choosing to study subjects such as maths, physics and chemistry (the enabling sciences) in years 11 and 12.

Vision

Through the provision of meaningful, hands-on experiences we aim to challenge more young people to make a difference in the world by choosing a career in Science and Engineering.

Mission

Our mission is to challenge students to build a future in Science and Engineering.

Tag line

Science and Engineering. Create our future. Make a difference.

Core values

1. People
2. Integrity
3. Involvement
4. Innovation
5. Excellence

The responsibilities of Regional Committees and the University of Newcastle

Make up of Challenge Regional Organising Committees

Challenge Regional Organising Committees need to represent their local communities. Members can come from any relevant professional group or organisation, or can be individual members of the community with an interest in promoting the Challenge. It is recommended that Regional Committees are chaired by a Rotarian and most communications should be channeled through this person.

The National Science and Engineering Challenge Council policy is that Regional Committees are as far as possible autonomous. Many committees undertake other science, engineering and technology-related projects and Challenge operations will support these activities if possible. It is expected that Regional Committees will be inclusive of all their relevant local stakeholders. They can develop constitutions or standard operating procedures if they feel this is necessary. A copy of any such document should be forwarded to the secretary of the National Council.

Local Committee responsibilities when preparing for a Challenge

- Determine the date and venue for the Challenge in consultation with the Challenge Events Manager.
- Initiate contact with schools.
- Make arrangements for a pre-event reception (dinner) as required.
- Coordinate local volunteers.
- Media liaison and promotion.
- Fund raising for non-salary Challenge costs.
- Distribution of post event student certificates.

Please note that starting at page 7 of this handbook there is a comprehensive checklist which can be used when preparing for a challenge.

University of Newcastle Responsibilities

- Provision of all equipment
- Planning of logistical requirements
- Event staff (outside the University of Newcastle footprint this includes a Team Leader and Event Assistant; within Nth NSW some activity coordinators are provided as well);
- Provision of a guest speaker (within Nth NSW)
- Running the actual day

Planning for your Challenge day

Preparing for a Challenge

All notes, equipment and consumables are provided as part of the Challenge package by the University of Newcastle. The organising committee is responsible for local pre-event organisation, in particular liaison with schools, organisation of the venue and provision of coordinators and assistants.

The following documents drive your event. Documents need to be checked and distributed as per the following schedule.

All documentation is provided to the Local Organiser via email by the Team leader or Events Manager. Please to not make any changes to the final document. In the case of the Regional Committees directly supported by The University of Newcastle all the documentation is managed by Challenge Operations.

The following checklist is quite comprehensive but not all items will apply for every Challenge. Local Organisers should liaise closely with the Events Manager or their Team Leader.

- Book venue for Challenge. Consider:
    - Suitability of flooring (is protective surfacing needed?)
    - Enough space for activities chosen
    - Drop-off/pick-up area for attending students
    - Bus and staff parking
    - Evacuation plan for the venue. Where is emergency assembly point?
    - For multiple-day events, overnight cleaning if required
    - Access, security and overnight storage of equipment
    - Use of a room for teachers' meeting
    - Provision of first aid
    - Availability of (tiered) seating
    - Location of toilets
    - Use and coverage of venue PA system (each Challenge team has their own PA system if needed)
    - Power and/or water as required by activity
    - Adequate room lighting
    - Food and drinking water facilities for volunteers and students
- Book tables, chairs and rubbish bins for the venue. These numbers should be checked with Challenge Operations to ensure the correct amount is ordered.
- Organise a suitable lunch for volunteers

Interacting with your schools

Ideally no later than 16 weeks prior to the Challenge you should post the initial invitations to schools to become involved. This Includes;

- Cover letter (to principal, head science and/or engineering teachers)
- School nomination form to indicate interest in participating

8 weeks before the Challenge you should email the Teacher's Guide to schools that have indicated their desire to participate. This includes;

- A brief cover letter/email
- The Teacher's guide which gives specific information about the Challenge and an Excel Student nomination form that records student names and their selected activity. (This is used for WHS reasons and to prepare participation certificates in some areas)

2 weeks prior to the Challenge you should email the final pre-event information to schools to distribute to students a few days before the Challenge. This includes;

- Cover letter/email (reminds schools that the list of student names may be overdue)
- Student Activity Handouts

How to best communicate with your schools

School teachers are very busy and quite often hard to contact. When you are trying to establish a contact within the school, the best approach is the blanket approach, i.e. try all avenues. The most common school contacts are;

- The Head Science teacher.
- The Head Industrial Arts teacher.
- The year 10 coordinator.
- The Principal.

Making contact is sometimes difficult as you often do not have a name. The key here is to be persistent. Two methods we recommend are;

- Call the schools individually and ask for any of the 4 suggested contacts. Once you have a name, email address and postal address, email your Challenge entry form to the appropriate person.
- Send a letter to each of the contacts at the school. Make sure you include a Challenge entry form and other information so they can send back their contact details.

Interacting with your volunteers

At least 3 weeks prior to the Challenge you should arrange event staff: Activity Coordinators and Activity Assistants. For Challenges in Model 2 it is highly recommended they commit to run an activity for the entire Challenge day. All Activity coordinators must attend the pre-event briefing, usually the day before the Challenge, to learn how to conduct their activity.

Arrange for Coordinators to view the online training videos, attend pre-event briefings and distribute the final pre-event information to all event staff. This includes;

- The Challenge Guide is sent out by the Team leader and describes in detail how the Challenge event will run. This should also be given to members of the Organising Committee. Note the Guide contains a number of quite detailed sections that may not be relevant for all event staff.
- Coordinators Activity Handouts which contain the information given to students plus additional tips and instructions on how to run the activity.
- Invite parents, grandparents and members of the community to watch the end-of-day test and presentation:
    - *A team of community members, sponsors, VIP's or politicians is also required to compete from lunch time. The Challenge Events Manager will advise the number of people needed to run your Challenge event.*
- Recruit event staff to be coordinators and assistants. Where the Challenge runs over several days it is preferable to have event staff stay with the activity they know.
- Where finances allow, consider producing t-shirts or equivalent for volunteers.
- Arrange morning tea and lunch for the event staff.
- Arrange morning tea and lunch for teachers and/or students (optional).
- Nominate a person to assist the Team Leader and Event Assistant on the day (usually the Regional Chair or Local Organiser).
- Distribute documentation, see below.
- Confirm schools and encourage them to submit student names promptly
- Arrange for media releases (assistance is available from Team Leader)
- Invite sponsors and VIP(s) to form a community team or just attend/participate in the Challenge presentations.
- Organise for maps, guides or signage to direct schools into the venue

At least one week prior to the Challenge, ensure the Team Leader has received:

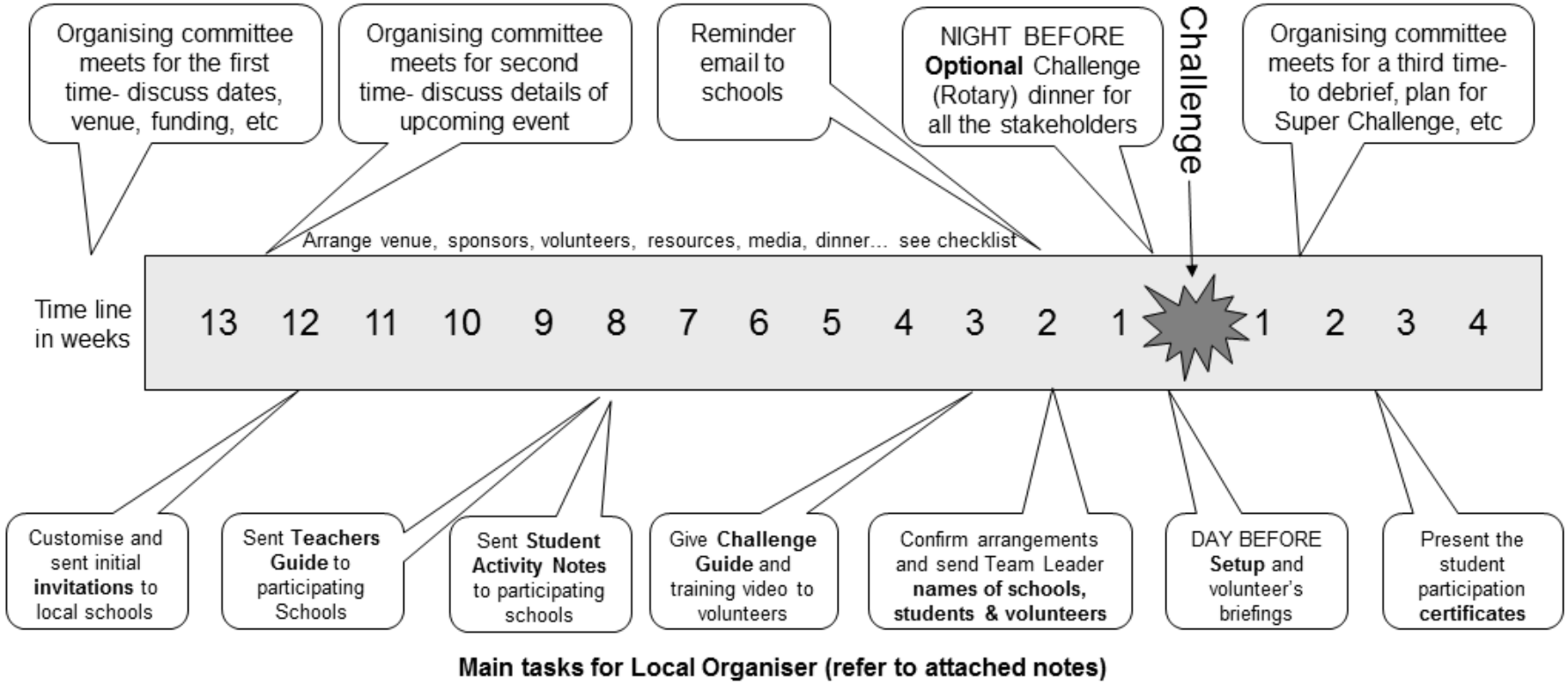
- Names of all coordinators and assistants
- Names and contact details of participating schools
- Names and activity selection of all students

Hosting a Challenge Dinner

- Book the dinner venue;
- Select a suitable menu;
- Develop a program (with Team Leader's assistance)
- Decide if a table experiment is required on the night (The Team Leader can provide this)
- Invite schools, sponsors and other stakeholders
- Select an MC and after-dinner speaker
- Attend to seating, PA and multimedia requirements.

TIME LINE FOR ORGANISING A CHALLENGE

Main tasks for Organising Committee (refer to attached notes)



Main tasks for Local Organiser (refer to attached notes)

Super Challenges

The Challenge is run in various Regions around Australia. Each Region conducts its own Challenge and the highest scoring winning schools proceed to the final known as a “Super Challenge”. Depending on the size of the state finals some high scoring second placed schools may be asked to make up the numbers at each Super Challenge. The highest scoring winners from the Super Challenges may be invited to the National Final. Should a Super Challenge not be run the highest scoring winning school from the state will qualify for the National Final.

The University of Newcastle provides funds to provide extra services to the Challenge Organising committees in the University’s footprint area. This means there are 2 different models that committees should be aware of.

Model 1

Model 1 is used in most regions across Australia. Many of these committees have another University attached to them which usually handles the administrative load done by the University of Newcastle in Model 2.

Communication between the University of Newcastle and the Regional Committees usually occurs through the Regional Chair. However, where appropriate the Regional Chair can delegate this to another member of the Regional Committee known as the “Local Organiser”.

Model 2 (Northern NSW only)

Model 2 is used in the Northern NSW area. The committees in these areas are provided with extra support as they are in the University of Newcastle footprint area. A representative from the University is attached to each committee, normally the Director. This additional support includes;

- Ordering of school trophies and sponsor/student certificates
- Provision of University of Newcastle after-dinner speaker (If required)

Challenge Organisation and Staffing

The National Science and Engineering Challenge Council (NSECC)

The National Council was set up by an agreement signed by the Department of Education, Science and Technology in 2005 (now DOI) and The University of Newcastle to oversee the Science and Engineering Challenge's operations around Australia. The Council sets the strategic direction and objectives for the Challenge. The first meeting of NSECC took place in August 2004 and was chaired by Tim Besley. The Council meets twice a year, with the first meeting held in February/March, and the second in September/October.

The Council has approved a number of policies and guidelines such as;

- The establishment of new regional committees.
- The training system used to prepare personnel for Challenge duties.
- Use of the Science and Engineering Challenge logo
- The conduct of Super Challenges and the Grand Challenge.
- Fundamental principles under which the Challenge operates.

At each meeting a report is supplied by the Director detailing the program's progress.

The Council has eleven positions for representatives from the different stakeholders. Regional chairs are appointed for a term of three years and are selected on a rotational basis between Challenge areas.

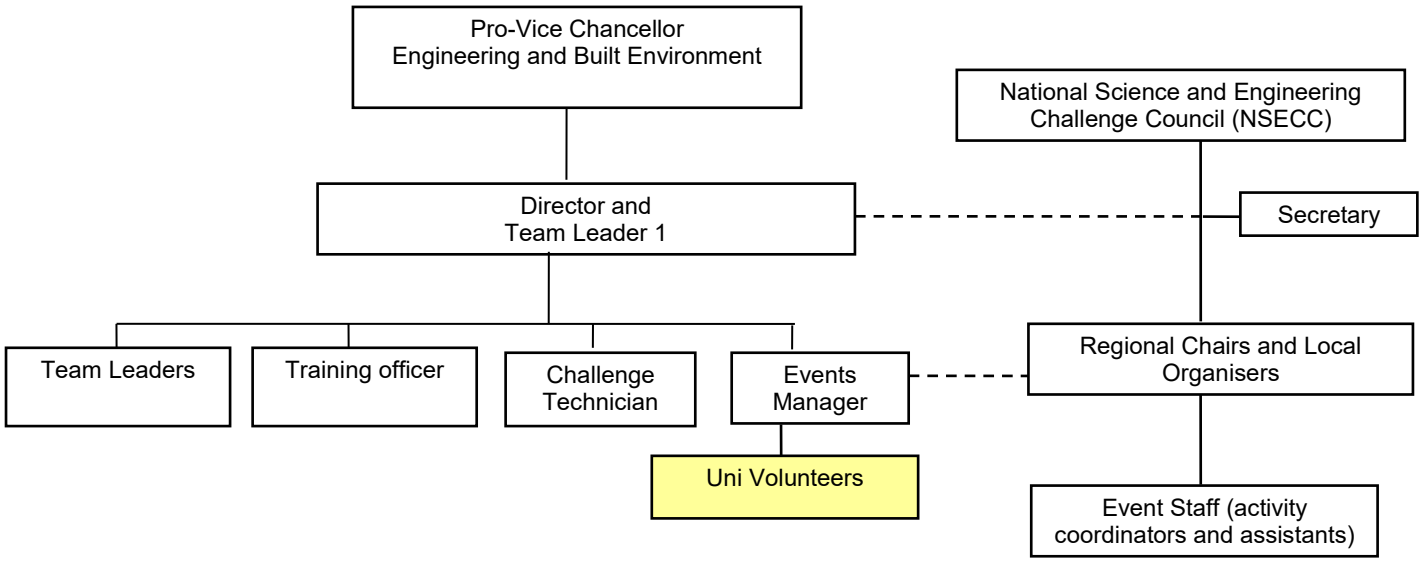
The positions and current representatives as per February 2016 are:

National Council Chairman	Tim Besley
Faculty of Engineering and Built Environment/Deans of Engineering	Brett Ninness
Faculty of Science and Information Technology/ Deans of Science	John O'Connor
Director	Terry Burns
DOI Representative	Milly Styles
Rotary Regional Chair Representatives*	Susie Haley (TAS)
	Ollie Clarke (SA)
	Tony Alsop (VIC)

*The Rotary representatives serve on a rotating 3 year term

Challenge Operations Team staffing

The Challenge Staffing structure



Director

The organisation is headed by the Director who is responsible for all aspects of Challenge operations. The Director ensures that all policies and guidelines approved by NSECC are implemented and has line reporting responsibilities within the University. The Director is also Team Leader 1 and is responsible for holding Challenges within the Newcastle University footprint (most of Northern NSW).

Team Leaders 2, 3 and 4

Team Leaders 2, 3 and 4 are full- time employees who are responsible for conducting Challenges in regions not covered by Team Leader 1. Before a Challenge they will work with the Events Manager and the Regional Chair/ Local Organiser to prepare for the Challenge. The Team Leader runs the actual day and provides expertise on all activities, as he/she knows how each activity operates and has the technical skills required to fix equipment should it fail.

Events Manger

The Events Manger is a full-time employee of the University of Newcastle who is responsible for coordinating the Challenge program across Australia. The Events Manager is the secretary to the NSECC, assists in the financial management of Challenge operations, and coordinates the Challenge

resources and is the initial contact in organising Challenge events. The Events Manger also is a trained Event Assistant and may travel with Team Leaders over the course of a year.

Challenge technician

The Challenge technician is based at the University of Newcastle and maintains the activities and equipment taken by the Team leaders to each Challenge. The Challenge Technician is also the safety officer and a trained Event Assistant.

Training officer (currently a volunteer position)

The Training Officer is responsible for maintaining the standard of Event Assistant training, conducting the Event Assistant final interviews and awarding the final qualifications in accordance with NSECC policy.

The Event Assistant

An Event Assistant (EA) accompanies the Team Leader to a Challenge and is a paid employee of the University of Newcastle. The role of the Event Assistant is to assist the Team Leader in the running of each Challenge day.

The Activity Coordinator

Activity Coordinators are responsible to the Team Leader for running the activity to which they are assigned. Prior to the event they are given a coordinator's guide providing information on the activity. They have access to a training video (explaining how to run their activity) and also have a one-on-one briefing with either the Team Leader or the Event Assistant. The Activity Coordinator is often a volunteer and is responsible for making any decisions specific to the running of their activity over the course of the day.

The Activity Assistant

Activity assistants assist the Activity Coordinator with running of each activity. The Activity Assistant will usually receive a handout before the Challenge but is not required to attend the briefing session. If they do not have any prior knowledge of the activity, the Activity Coordinator is responsible for briefing them on the Challenge day. There are usually 2 or 3 Activity Assistants per activity. The Activity Assistant is also a volunteer.

Challenge activities

All Science and Engineering activities involve the principles of science, engineering and technology. The concept is to immediately engage students in the activity with a minimum of introduction and theory. Students explore scientific principles for themselves rather than being guided to a predetermined answer. The activities we currently have for are:

Full day activities;

- Bridge
- Catapult
- The flat pack challenge (back up activity for Catapult)

Half day activities;

- Grasping at Straws
- ElectraCITY
- Confounding Communications
- Stringways
- Turbine
- Helter Skelter Shelter

In order to keep a broad range of activities, each year 1 or 2 new activities are developed and added to the activity suite, and 1 or 2 current activities are retired. Ideas for new activities are gathered and scholarships are offered to undergraduates to develop these.

Requirements for Challenge Activities

Three full-day activities (Figures are based on eight teams competing)

Duration	Activity name	Overview	Floor area	Volunteers	Furniture	Special requirements	Power
Full Day	The Bridge##	Build a small bridge from balsa, pins, tape, paddle pop sticks etc. Points are awarded for strength and load-carrying capacity (tested with dynamic loads).	An area at least equal in size to a school double-classroom.	1 coordinator 1-2 assistants	12 large tables 38 chairs	The bridges are usually tested as part of the finale and presentation.	No
Full Day	Catapult	Construct a catapult from dowel, elastic bands and weights to launch a tennis ball. Points are awarded for distance and accuracy.	Outside sports field OR Indoor area at least the size of half a basket ball court.	1 coordinator 1-2 assistants	1 large table 2 chairs	A clear outside area passers-by cannot stray onto. Sun shade (tents/awnings) recommended.	No
Full Day	The flat pack challenge (Back up)	Students are required to design and build a chair. Each group will be "charged" for labour and materials and then given income based on the strength of the chair. The chair with the highest profit will win. Students complete this activity in three phases, prototyping, production and evaluation.	An area at least equal in size to a school double-classroom.	1 coordinator 2-3 assistants	10 large tables 35 chairs		No

Six half-day activities (Figures are based on eight teams competing)

Duration	Activity name	Overview	Floor area	Volunteers	Furniture	Special requirements	Power
Half Day	Stringways	The aim of this half-day activity is to develop networks that join a series of points in the most efficient way possible. The higher the efficiency of linkage (i.e. minimum travel distance) the more points your team earns.	An area at least the size to a large school classroom.	1 coordinator 2-3 assistants	9 large tables 34 chairs	A quiet, closed-off room is recommended to allow students to work without distractions.	No
Half Day	ElectraCITY	Students will be given a board with which they can simulate power distribution. Students will be provided with different quality cables and are required to make all loads operate. Students are assessed on the cost of their network, and how many loads are shed due to the failure of a power source.	An area at least the size to a large school classroom.	1 coordinator 1-2 assistants	9 large tables 34 chairs	A quiet, closed-off room to allow students to work without distractions.	Power to recharge batteries (o/night)

Half Day	Helter Skelter Shelter	Using only basic materials, students have to construct a tall, earthquake proof tower. At the end of the session the towers will be put to the test on an electric earthquake simulator	School double classroom	1 coordinator 1-2 assistants	9 large tables 34 chairs		No
Half Day	Confounding Communications	Each group of students will be provided with 2 terminals, which they will use to communicate with each other using various coloured light transmitted through an optical fibre. Students will be assessed on their speed and accuracy.	School double classroom	1 coordinator 1-2 assistants	9 tables 34 chairs		Power to recharge batteries (o/night)
Half Day	Grasping at Straws	Students are required to design, build and use a 'bionic hand' built from PVC pipe, string, straws, and timber coffee stirrers. Each group will then assess the effectiveness of their construction in several tests.	Indoor area *at least* the size of half a basket ball court.	1 coordinator 1-2 assistants	9 large tables 34 chairs	Floor must be flat and, ideally, not carpeted.	No
Half Day	Turbine	Students construct a water turbine from Styrofoam, plastic and tape. The design is tested to determine its capacity to generate electrical power.	School double classroom	1 coordinator 1-2 assistants	9 large tables 34 chairs	Can be run indoors or outdoors but requires about 5 litres of water	No

Additional space for administration of the event

ADMINISTRATION	A small, centrally located floor space is required for the University of Newcastle staff to set up an event office. It should NOT be in a separate room.	The size of an office cubicle, approx. 9 square metres	One person to check score entry at lunch and end of day	1 large table 2 chairs	Adjacent to the main entry and near the bridge-test area is a good choice. Access to a power point.	Yes
TEACHERS MEETING ROOM / LUNCH ROOM	A quiet location to conduct the teachers briefing and where coordinators can get refreshments / food.	An area the size of a school classroom.		1 table 20 chairs	A quiet area with water and power for making tea and coffee.	Yes for coffee making

Notes

Student handouts and Event Staff notes are sent out via email in advance.

When selecting a venue please ensure that security, room acoustics and lighting are adequate. Vehicular (including school buses) and personal access is important. Access to a meeting room and to canteen/kitchenette facilities is desirable. One rubbish bin per activity should be ordered.

Please ensure the venue has an up-to-date emergency evacuation plan and adequate resources for first aid.

An area for all the students to sit during the start-of-day briefing, and the end-of-day bridge testing / presentation is also required. A grandstand is best, but almost any large area – ideally with tiered seating – will do.

Financial interactions with the Challenge

Since the inception of the Challenge, the University of Newcastle (UoN) has provided the financial structure for the purposes of paying and collecting money. The Challenge operates under the University financial department, using the UoN's ABN to function. This has caused confusion in the past as to whether money will reach the Challenge by going through the University - It does. Over the last few years the UoN has brought its financial practices in line with how businesses are expected to operate and the Challenge has followed suite. The two processes involved will be explained in more detail in their own sections, broadly categorised as 'we take' money and 'we give.'

We Take

The most common monetary interaction between a Regional Committee and the Challenge is paying the bill for the event. This is a sum of money that covers most of the logistics of getting two employees and a van of equipment to and from the event. At the beginning of each year, once the calendar of events has been sorted and the budget finalised, the Events Manager will send out a Purchase Order (PO) request form. This document has multiple purposes. First, it informs the committee of the cost required to be paid to the Challenge for running the event. Second, it provides the Challenge and the UoN all the necessary details about the paying organisation and their contact person. This will ensure that each year the Challenge is talking to the right people and sets the company up as a debtor in the system. Third, the UoN will not create an invoice without a purchase order number being obtained. From a financial perspective, a PO is a promise of funds being available to pay the specific amount stated. All universities and businesses that have a financial division will be able to produce a PO and must create and supply a copy to the Challenge. Some smaller groups (such as Rotary Clubs) cannot create PO's. In these circumstances there is a specific check box on the form and we have a special understanding with the UoN for these circumstances. It is important to note that the Challenge WILL NOT run an event until this form has been filled in and returned unless permission is given by the Director.

The Challenge will hold onto the PO until after the event has concluded before raising an invoice. After the invoice has been created, the recipient has 30 days to pay it, after which the UoN debt collectors are automatically involved. This is something the Challenge has no control over, so if there is going to be a problem with paying the bill, it is best to bring it up before the event so we can delay processing the PO.

There are two Alternatives to the PO system, one, an Electronic Funds Transfer (EFT) can be organised however, and by far the simplest (and thus preferred) method of giving money to the

Challenge is by sending a cheque. Just mail the cheque and the Challenge will take care of the rest:

The Challenge
EF100
The University of Newcastle (UoN)
University Drive
Callaghan NSW 2308
Australia

We Give

The Challenge has two ways of paying out money, the first being simply on credit card. The other involves the same PO system described above. When an invoice is sent to the Challenge, the details are checked against the system. Should the invoice come from a company not set up as a creditor, the UoN finance department will contact the company directly. No Challenge employees are involved with this section as to prevent any potential fraud situations. After the company is a UoN creditor, the invoice can be paid. The invoice requires a few back and forth approvals before UoN finance will release payment. This payment occurs at the end of the month after all approvals have been obtained. Due to the lengthy approval process, it can take quite a while for money to be delivered this way.

The Media Pack

To assist Regional Chairs and their respective committees a Regional Chairs media pack is available with draft Media releases relating to the Challenge. The material provided is generic only and should in no way be seen as restrictive. Regional Chairs are encouraged to provide additional and alternate information if appropriate. It may not be necessary for all the enclosed releases to be used.

The Media pack is divided into four sections covering long term promotion for the Challenge, medium-term Challenge promotion, Media notification for the actual event and a report on the Challenge itself. It is accepted that many Regional Committees have close relations with local media and it is not mandatory for them to use these media releases.

If your Committee is interested in obtaining a copy of the Media Pack please contact the Challenge Events Manager and one will be sent directly to you. Please see page 4 for contact information.

In any contact you have with the media it is important to acknowledge;

- The University of Newcastle.
- Any other University that directly supports your event.
- Sponsors.

Challenge history and background

The Challenge began at the University of Newcastle as an initiative of the Faculty of Engineering and Built Environment, and the Faculty of Science and Information Technology. Originally these faculties conducted information nights aimed at giving students and parents the opportunity to learn about careers in science and engineering, hoping to influence the students to continue their studies in the enabling sciences. These nights were not very successful, so another approach was sought.

In 2000 the NSW National Science Week Coordination Committee approached Bob Nelson at the UoN to hold an activity for National Science Week on the Central Coast, NSW. This first Challenge event aimed to gain the students' interest through a game or competition, and providing the Central Coast with an event for National Science Week. It was very similar to the Challenge as we know it today, however, it catered for 10 schools per day instead of eight. A second Challenge was successfully trialed in Kempsey NSW in August 2000 with the involvement of the Rotary Club of Kempsey West.

By this time, a Rotarian from Dubbo NSW suggested that Rotary could provide valuable volunteer support to expand the Challenge program, across different regions in Northern NSW. A new approach involving Rotary was trialed in Dubbo and Armidale NSW, and was an outstanding success. Regional Organising Committees were quickly established in Muswellbrook, Dubbo and Tamworth and, in 2001, the first Super Challenge was held in Newcastle during National Science Week. This event was very successful and was an exciting climax to the years Challenge competition.

The University of Newcastle decided to hold a Challenge outside the Newcastle University footprint area and Bob Nelson was again asked to develop a plan which, with the help of Rotary, would enable this to happen. The first Challenge conducted outside the Northern NSW area was held in Canberra in 2002.

Following the success of the program in 2002 the Challenge was recognised with an award from the Institute of Physics (UK) for the Public Promotion of Physics, and in 2003 with the Institution of Engineers highest excellence award, the Sir William Hudson Award for the best Engineering project within Australia.

As the Challenge continued to develop it started to attract interest from organisations such as Engineers Australia, and the Commonwealth Department of Education, Science and Training (DEST) which in 2008 changed its name to the Department of Innovation, Industry, Science and Research (DIISR).

In 2004 DEST recognised the success of the Challenges and provided financial assistance for the program to expand nationally. With this new funding the Challenge experienced significant expansion into Queensland, Tasmania, South Australia and Victoria. A National grand final called the Grand Challenge was held in Newcastle for the first time in 2005.

By 2011 the Challenge has expanded into every state and territory in Australia, reaching over 100,000 students from over 500 schools and involving over 2500 volunteers. The number of Challenge regions increased from 5 in 2001, to 56 in 2012. This expansion has been achieved through the support of the Federal Government, Rotary International, Engineers Australia, over 20 universities, and many communities and sponsors. It is held up as an exemplar of the use of community engagement to achieve an important community goal.

The biggest change in 2013 is the introduction of a new team leader, to lighten the load of existing team leaders and enable more expansion of the Challenge. This has been effective with an increase of over 1000 students and 70 schools from 2012. It has also been a productive year for the Challenge; with one brand new activity being developed and retired activity being revamped for 2014, as well as two new table activities.

The Challenge has not been limited to Australia. In October 2007 the first international Challenge was held at The University of Newcastle campus in Singapore. Interest has been expressed to expand the program into other countries.

Policies

Policy for deciding the venue for The Science and Engineering Challenge National Final

Each Challenge is part of a national program that, where resources allow, culminates annually in the National Final.

The decision on where the venue for the National Final rests with the National Science and Engineering Challenge Council (NSECC). The successful bidder is invited to stage the National Final the following year in the period between Science Week and the end of November.

The decision is based on the criteria outlined below:

- Bids may be submitted by a Regional or State Organising Committee.
- The applicant must demonstrate suitably qualified staff with experience of running regional challenges. Experience running a Super Challenge is highly regarded.
- Must have suitable infrastructure for a national event, including spectator and media access.
- Suitable accommodation for visiting teams.
- Sufficient funds are available to meet expenses of running the National Final.
- Capacity to maximise public exposure, both directly and via the media.
- A communication strategy which aims to gain national media coverage.
- An experienced Chair of the Organising committee.

Policy for the Challenge and the release of promotional material

The Science and Engineering Challenge brand is one of its most valuable assets. Responsibility for protecting this brand lies with the National Council, the University of Newcastle, and all stakeholders. A balance between providing regional committees with the flexibility to promote their event and the need to protect the Challenge brand must be established and maintained.

This policy applies to the development and production of promotional material, as well as the conduct of Challenge events.

Information and promotional items relating to the Challenge may be produced and released by

- NSECC.
- The University of Newcastle
- The Department of Industry, Innovation, Science, Research and Tertiary Education
- Regional organising committees via their regional chair.

A region or state wishing to produce video or documents to promote the Challenge must clear the content with the Director before production and distribution.

Video or documents promoting the Challenge should:

- Provide appropriate acknowledgement of the University of Newcastle.
- Ensure that permissions are obtained for any photographic or video material used.
- Ensure the Challenge is portrayed as a national program rather than one that is restricted to a single organisation, institution or event.
- Ensure the purpose and aims of the Challenge are correctly portrayed.
- Not claim or imply that ownership of the Challenge lies with one organisation or institution.
- Not use the Challenge as promotional tool for an individual organisation or institution without due recognition of the broader program and its stakeholders.
- Material produced by a regional or state committee must have that committee's name and the date incorporated into the document.

Local Media

Regional chairs are expected to exercise their judgment when dealing with local media to publicise the Challenge in their local region. The above guidelines should be used by regional chairs when communicating with local media.

There have been isolated instances in the past where regional committees have sought to vary the way the Challenge day runs in order to promote an individual institution, event or organisation. This is not permitted, and Challenge Team Leaders have been instructed not to accede to such requests. There are opportunities during the presentation at the end of the day for the promotion of sponsors and hosting institutions and organisations.

Promotional Items

Regional committees, challenge operations and NSECC are able to fund, produce and distribute promotional items provided:

- They include the Challenge logo or at a minimum the words "Science and Engineering Challenge".
- The item is appropriate for the Challenge and its target audience.
- Other logos if appropriate may be incorporated, the University of Newcastle, providing appropriate permissions are sought and gained from that organisation or institution.

Should any clarification be required please contact the Director or the Secretary to NSECC.

Activity selection for consecutive Challenges and tours

Situations arise where two or more Challenges are conducted consecutively by a Team Leader with no opportunity to return to Newcastle to restock consumables (a "tour'). Logistically, a

maximum of nine activities can be carried. In such situations it is not possible for every committee to have a free choice of all the available activities. In order to maintain the independence of each committee the following policy will apply:

When two different committees are running consecutive Challenges, activities should be selected as follows:

- Each committee shall have their choice of activities on alternate years OR
- Provided both committees agree, the committees may jointly select the activities.

In a situation where three or more committees are involved, the committees will be advised of the situation and need to collaborate to decide on a common set of activities. If this cannot be done then the committees will be asked to select nine activities. The lists will be compared by the Events Manager, and the combined preference for all activities calculated. The activities will then be determined as follows:

- Include all activities on all three lists. If all nine activities are chosen in common, then each committee's least favored activity will not be offered for their Challenge.
- If the number of activities nominated by every committee is less than that required, then activities that appear on two lists will be added in order of combined preference.
- If the number of activities is still insufficient then activities are added in order of combined preference.

This should be done with due consideration to the space restrictions at each of the venues. In situations where particular activities cannot be offered at a venue then this will be communicated to the other committees before they determine their preference.

Naming rights for Challenge events

Should you have a company sponsor your event to a significant amount you may wish to offer them naming rights for your Challenge event. This is a prestigious offer and may entice them to sponsor in the coming years. The current amount for a company to secure this is $5,000 per Challenge day. We suggest talking to your Team Leader for further advice.

This would change the name of your event to for example, "The Coal & Allied Upper Hunter Science and Engineering Challenge". The only exception to this is the National Final as it can only be taken by a national sponsor for a much greater amount.

Rotary International

Rotary International (also known as the Rotary Club) is an international service club whose stated purpose is to bring together business and professional leaders in order to provide humanitarian services, encourage high ethical standards in all vocations, and help build goodwill and peace in the world. It is a secular organisation open to all persons regardless of race, colour, creed, religion, gender, or political preference. There are 34,282 clubs and over 1.2 million members worldwide. The members of Rotary Clubs are known as Rotarians. Members usually meet weekly for breakfast, lunch or dinner, which is a social event as well as an opportunity to organise work on their service goals.

Rotary's primary motto is "Service above self"; an earlier motto, "One profits most who serves best".

Philosophy

The object of Rotary is to encourage and foster the ideal of service as a basis of worthy enterprise and, in particular, to encourage and foster:

1. The development of acquaintance as an opportunity for service;
2. High ethical standards in business and professions, the recognition of the worthiness of all useful occupations, and the dignifying of each Rotarian's occupation as an opportunity to serve society;
3. The application of the ideal of service in each Rotarian's personal, business, and community life;
4. The advancement of international understanding, goodwill, and peace through a world fellowship of business and professional persons united in the ideal of service.

This objective is set against the "Rotary 4-way Test", used to see if a planned action is compatible with the Rotarian spirit. The test was developed by Rotarian and entrepreneur Herbert J. Taylor during the Great Depression as a set of guidelines for restoring faltering businesses and was adopted as the standard of ethics by Rotary in 1942. It is still seen as a standard for ethics in business management.

The 4-Way Test considers the following questions in respect to thinking, saying or doing:

- Is it the truth?
- Is it fair to all concerned?
- Will it build goodwill and better friendships?
- Will it be beneficial to all concerned?

The Department of Industry

The Department of Industry strives to encourage the sustainable growth of Australian industries by developing a national innovation system that drives knowledge creation, cutting edge science and research, international competitiveness and greater productivity. The Department is committed to developing policies and delivering programs, in partnership with stakeholders, to provide lasting economic benefits ensuring Australia's competitive future.

The Department provides policy advice to its Minister and the Government, administers legislation, manages programs, undertakes analysis, and provides services and advice to the business, science and research community.

The Department is structured into a number of divisions including AusIndustry (www.ausindustry.gov.au) and Questacon (www.questacon.edu.au).The Office of the Chief Scientist is also located within the Department.

The Department has its headquarters in Canberra and state offices located in Adelaide, Brisbane, Hobart, Melbourne, Perth and Sydney, as well as territory and regional offices across Australia.

The University of Newcastle

The Science and Engineering Challenge was established at the University of Newcastle as a joint partnership between the Faculty of Engineering and Built Environment and the Faculty of Science and Information Technology.

The Faculty of Engineering and Built Environment

The Faculty of Engineering and Built Environment is one of the leading faculties of its kind in Australia with a reputation for high quality teaching and research and strong links with industry. Its research intensive environment has helped attract high calibre academic research staff from throughout Australia and around the world.

The Faculty brings together expertise in engineering, architecture, building, surveying, industrial design and computer science. Degree programs focus on the development of innovative, resourceful and creative graduates - future leaders in industry, the profession and the community.

The Faculty of Engineering and Built Environment is one of the leading faculties of its kind in Australia. It achieved outstanding results in the Australian Research Council 2012 ERA research excellence ratings, with a top rating of 5 (well above world standard) for the two digit Engineering and a rating of 3 (at world standard) for Built Environment and Design.

The Faculty of Science and Information Technology

With impressive research and teaching facilities, the Faculty of Science and Information Technology delivers degree programs across the key areas of science, maths, psychology, sport and exercise, communication, information technology, food and nutrition, development studies, design and illustration. The Faculty works in partnership with local industry, health services, and government and non-government organisations to optimise achievements in teaching and research.

The Faculty of Science and Information Technology is a world-class centre for scientific and technology research and innovation. Through strong discipline-based research and active inter-disciplinary engagement, both nationally and internationally, the faculty is at the forefront of research and development in a broad range of fields.

Research strengths lie in the key areas of industry and infrastructure, sustainability and the environment, health and wellbeing as well as communication and information technology.

University Partners

Other Universities we proudly partner with are;

- Australian Catholic University
- Australian National University
- Central Queensland University
- Charles Darwin University
- Charles Stuart University
- Curtin University of Technology
- Deakin University
- Edith Cowan University
- Flinders University
- Griffith University
- James Cook University
- La Trobe University
- Macquarie University
- Murdoch University
- Queensland University of Technology
- Southern Cross University
- University of Adelaide
- University of Newcastle, Singapore
- University of New England
- University of New South Wales
- University of Queensland
- University of South Australia
- University of Southern Queensland
- University of Sydney
- University of Tasmania
- University of Technology Sydney
- University of the Sunshine Coast
- University of Western Australia
- University of Western Sydney
- University of Wollongong
- Victoria University