



**Joint Ground Robotics Enterprise
Robotic Range Clearance Competition
(R2C2)**

Competition Questions and Answers

v. 26 FEB 2010

Document Change Summary

Section	Description	Date

CONTENTS

1	Executive Summary	8
1.1	Scope.....	8
1.2	Purpose	8
2	Competition Questions and Answers.....	9
2.1	Questions related to the IDIQ.....	9
2.1.1.1	Will the IDIQ be a service contract or equipment supply?.....	9
2.1.1.2	What are the IDIQ evaluation criteria?.....	9
2.1.1.3	What is the size of the IDIQ?.....	9
2.1.1.4	How does the competition criterion differ from the IDIQ contract criteria, particularly as it relates to the level of autonomy?.....	9
2.1.1.5	What contract vehicles are expected to provide the bulk of the work in the next 5 years? Is WERS expected to be a big player? Or will the IDIQ support the UXO clearance market?.....	9
2.1.1.6	Can you layout the difference in Service market size? Has the Army already spoken to present vendors on this robotics need?.....	9
2.1.1.7	Will the USAEC explain the relationship of the Competition and the selection criteria for the IDIQ?	9
2.1.1.8	Will you provide cost data for range clearance services that are competitive today? This is requested so we will know if our automation is cost effective for the IDIQ.....	9
2.1.1.9	Is there any possibility that the IDIQ RFP would be restricted to small business?	9
2.1.1.10	Will the IDIQ contract be a MATOC or SATOC?.....	9
2.1.1.11	Do you have to be involved in the prize competition to bid on the IDIQ?	10
2.1.1.12	Are you going to be looking for night operations on a UXO site?	10
2.2	Questions Related to the Competition	11
2.2.1	Competition Goals.....	11
2.2.1.1	Any thought on funding upfront costs and lowering the prize?	11
2.2.1.2	Can you publish the reports documenting the work, production, lessons learned, what worked and what doesn't, strategies used, etc.?	11
2.2.1.3	If existing tele-op systems are already more cost-effective than manual system, why require autonomy in the competition? Shouldn't tele-op be allowed to compete?	11
2.2.1.4	It appears to me that an autonomous robot would still require the same amount of "handlers" as a teleop capability, i.e., more expensive but no savings in manpower. So, why the push for autonomous?	11
2.2.1.5	The competition should be designed either for a FUDS type clearance, a range clearance, or a range construction mission.....	11
2.2.1.6	Is there a preference to a single vehicle vs. multiple vehicles to complete the tasks?.....	11

2.2.1.7 AFRL has supported projects in MMR, Honey Lake, Ft. Bliss, etc. If the USACE can simply request AFRL to perform a clearance somewhere, why or how could the private sector compete with that? Eventually autonomy in operations will be attained by AFRL. 11

2.2.1.8 Will the teams and their competitors be publicly announced?..... 12

2.2.1.9 Taking into consideration the current political and economic environment-What impact or risk will the announcement of the administration’s decision to send an additional 30 thousand troops into Afghanistan have on this effort, i.e., schedule slip; loss of identified funding, etc., keeping in mind that this troop increase is not in the current budget. So the military and Congress will have to find money to support and typically look to sourcing through cuts to programs either ongoing or new programs/efforts..... 12

2.2.2 Competition Rules..... 12

2.2.2.1 Are we considering GPS denied areas as a consideration in the scoring? 12

2.2.2.2 Interactions per acre or per time?..... 12

2.2.2.3 In the business there is enhanced teleops—automated. Will teleop be prohibited?..... 12

2.2.2.4 Will we pick a site that matches what a team intends to do? 12

2.2.2.5 On vegetation - how are you to rate vegetation removal by size of equipment and level of autonomy? An expensive high production compared to several inexpensive low capability units?..... 12

2.2.2.6 How will competitors be judged? Example, under vegetation clearance is clearance rate more or less important than amount of material removed. For example, if I can leave large trees in place, I may be able to do it quicker. 12

2.2.2.7 You have stated that each competitor will have a different area to clear at Camp Guernsey. Will these areas be mapped ahead of time so that you know what is there? Otherwise, how will you evaluate vehicle performance at that location? 12

2.2.2.8 Will foreign clearance companies be allowed to participate as a sub-contractor to a US prime contractor? 13

2.2.2.9 Is the sensor suite for mapping and marking specified? Can you describe it, or what are the characteristics of ordnance, i.e., metallic, etc.? 13

2.2.2.10 Why is marking with flags separate from excavation for an autonomous robotic system? 13

2.2.2.11 How large an area for vegetation clearance? What is comms range? LOS? Frequencies? Will there be comms deconfliction? What will be the slope? 13

2.2.2.12 Can we change the 3000 feet exclusion to say 3000 feet from the operational equipment as opposed to 3000 feet from the perimeter?..... 13

2.2.2.13 How many shifts per day? 13

2.2.2.14 Will we be given a chance to give them a return home function if comms are lost? 13

2.2.2.15 Define range perimeter?..... 13

2.2.2.16 JGRE JAUS compatibility? 13

2.2.2.17	How does the ESCIP focus on UXO classification apply to the geophysical mapping component of the prize competition?	14
2.2.2.18	Driver is cheaper, safer (?). If someone is to bring a teleop system will they be able to compete.	14
2.2.2.19	Does monitoring equate to human interaction?	14
2.2.2.20	Will duration of interaction be measured?.....	14
2.2.2.21	Define payload? Driving or buck ops is payload? (?).....	14
2.2.2.22	Would a pre-range walk count:.....	14
2.2.2.23	Will competitors be allowed to perform a range walk prior to employing their system for any/all categories?.....	14
2.2.3	Competition Procedures.....	14
2.2.3.1	Can you publish the reports documenting the work, production, lessons learned, what worked and what doesn't, strategies used, etc.?	14
2.2.3.2	Will competitors have access to area prior to run?	14
2.2.3.3	What will be the slope?	14
2.2.3.4	Communications de-confliction?.....	15
2.2.3.5	Will communications be line of sight or indirect?	15
2.2.3.6	Foreign national visitor approval?.....	15
2.2.3.7	Will competitors have to prepare and submit workplans and safety plans?	15
2.2.3.8	EM 385-1-97 and other DoD publications state that when mechanical means are utilized for UXO removal, the maximum fragmentation distance will be observed as an exclusion zone, i.e., 155mm HE projectile + 2,577 feet. Will an exclusion zone be established for personnel standoff distance?	15
2.2.3.9	What is the expected range of (LOS/NLOS) operation?	15
2.2.3.10	Limit on the number of competitors?.....	15
2.2.3.11	How many competitors to move forward? 2-3?.....	15
2.2.3.12	Will Competition documents be available in the public domain? For example, Competition rules, Qualification results, Evaluation criteria.....	15
2.2.3.13	Can we get an example GIS.DQM.SMP (sp?) file package from Guernsey to review and consider in planning and design?	15
2.2.3.14	Spectator area?.....	15
2.2.3.15	Sponsors: are you going to make this a media event so sponsors will care?	15
2.2.3.16	Will frequencies in 5-6 GHz be available?	16
2.2.3.17	Can you provide a section in the FAQ that records questions asked but yet to be answered so we know the question has been received?	16
2.2.3.18	How will we know the teams have lost comms?	16
2.2.3.19	Applies to loss of either E-stop comm and (?)?	16
2.2.3.20	Fire extinguishers in each vehicle?.....	16
2.2.3.21	Halon required on the vehicle?.....	16
2.2.3.22	What are the qualifications of the safety officer? Will they be required to be UXO (?).....	16
2.2.3.23	If remotely 3000 feet away, how will you know the boundary?.....	16

2.2.3.24	Will accurate mapping and contour be provided?	16
2.2.3.25	Can they fly UAVs first?.....	16
2.2.3.26	Civilian manned aircraft ... (?).	17
2.2.3.27	If all systems to be used in the competition are fully functional and in operational mode at active installations, do we have to participate in the qualification trials?	17
2.2.3.28	How do you expect robot operations to begin at 3000 feet?	17
2.2.3.29	What about hard cord connection?.....	17
2.2.3.30	Could you provide more explanation on what the competitive field generally may look like?	17
2.2.3.31	How accurate is GIS, slope, etc.?.....	17
2.2.3.32	Range footprint for DGM site?	17
2.2.3.33	What altitude does the installation own?.....	17
2.2.3.34	Will packet of lessons learned be made available for review? When? Will the package be posted to the web site?	17
2.2.3.35	The statement was made that the decision to allow an inspection of the performance has not been made. My suggestion would be to allow a site-walk consistent with an inspection of the range area prior to a procurement. The benefits include visual recognition of hazard areas or avoidance features. Would a site-walk of this nature be allowed?	17
2.2.3.36	Who is liable for a fire?	18
2.2.3.37	Not to change profile. Does this include the sub-surface task?.....	18
2.2.3.38	Will the geophysical mapping area be located in open terrain where GPS signal is attainable?.....	18
2.2.3.39	How does the 300 foot exclusion compare to the 3000 feet exclusion? ..	18
2.2.3.40	Will you expect the system to look for and avoid UXOs during brush cutting operations?	18
2.2.3.41	How will we be judged? Time, production, quality?.....	18
2.2.3.42	Are unit operating costs going to be evaluated as part of the prize competition?	18
2.2.4	Competition Procedures (GFE)	18
2.2.4.1	More on GFE – Geophysical sensors as GFE?	18
2.2.4.2	ARTS GFE with attachments?.....	18
2.2.4.3	ARTS equipment and robotic support GFE?.....	18
2.2.4.4	Excavator, dozer, etc. GFE?	18
2.2.4.5	Do you have an idea of how many ARTS vehicles would be available as GFE?	18
2.2.4.6	Superday?.....	18
2.2.4.7	Flail or range master will a 10-15% growth rate (?).	19
2.2.4.8	The OSD is mandating at least two mobilizations of the equipment to the test site. First for the qualification and the second for the competition. Given the cost of equipment mobilization and since the primary purpose of the qualification is to verify the equipment meets the competition published safety	

requirements will OSD consider the following: 1. Have the evaluation team travel to the competitors site to view equipment and perform the qualification or: 2. Allow competitors to skip the qualification phase and work at their risk up till the competition. At which time the competition committee will inspect equipment in two phases. Phase one is on the trailer. If the equipment does not meet requirements it is not unloaded until meets standard or rejected completely. Phase 2 is operational test. Again if the equipment does not meet requirements and cannot be promptly modified it is disqualified without further testing/evaluation. It will be the competitor's responsibility to promptly remove the equipment from the test site?..... 19

2.2.4.9 If a company is and has known capabilities are they required to physically attend the qualification round or can they submit a video of systems? 19

2.2.4.10 Will the seeded range that you perform DGM work? 19

2.2.4.11 Would that be the same that we'll perform removal action on? 19

2.3 Unanswered Questions 19

2.3.1 Questions related to the IDIQ 19

2.3.1.1 Is there a guarantee of funding for IDIQ? 19

2.3.2 Competition Goals..... 19

2.3.3 Competition Rules..... 20

2.3.3.1 How many acres will be clear cut for vegetation removal?..... 20

2.3.3.2 For competition, what will be the mass required to be lifted? 20

2.3.3.3 How fast do tasks need to be completed? What is the time limit on the competition? 20

2.3.3.4 If they fly a manned vehicle, how does this affect the scoring?..... 20

2.3.4 Competition Procedures..... 20

1 EXECUTIVE SUMMARY

1.1 Scope

This document lists questions posed by kickoff meeting attendees, Industry Day meeting attendees, and other potential competitors in the Robotic Range Clearance Competition (R2C2) about the competition rules, logistics, scoring, etc., and their answers.

1.2 Purpose

The purpose of this document is to establish a reference for questions that competitor teams have asked and the answers provided by the R2C2. The intent is to periodically update this document as questions are added or as answers change.

It is important to note that these answers are intended to be informational and supplement other sources of information about the R2C2 competition. The R2C2 Competition Rules and Metrics document acts as the authoritative source for competition rules and metrics. In the event of a conflict between the text of this document and the current R2C2 Competition Rules and Metrics document, the text of the current version of the R2C2 Competition Rules and Metrics document takes precedence.

2 COMPETITION QUESTIONS AND ANSWERS

2.1 Questions related to the IDIQ

2.1.1.1 Will the IDIQ be a service contract or equipment supply?

ANS: Acquisition decisions will be made after market research. Current expectations are an IDIQ service contract.

2.1.1.2 What are the IDIQ evaluation criteria?

ANS: TBD. Typical criteria include cost, quality, schedule, experience, capability, past performance. The Performance Work Statement (PWS) = End state, not how to.

2.1.1.3 What is the size of the IDIQ?

ANS: TBD. Maybe \$40M.

2.1.1.4 How does the competition criterion differ from the IDIQ contract criteria, particularly as it relates to the level of autonomy?

ANS: The prize competition is designed to push autonomous solutions that are safe, cost effective and deliver the necessary level of quality. The IDIQ contract is seeking similar outcomes therefore the criteria will be similar.

2.1.1.5 What contract vehicles are expected to provide the bulk of the work in the next 5 years? Is WERS expected to be a big player? Or will the IDIQ support the UXO clearance market?

ANS: The Government will use all available vehicles as to its best interest.

2.1.1.6 Can you layout the difference in Service market size? Has the Army already spoken to present vendors on this robotics need?

ANS: No to the first question, and yes to the second.

2.1.1.7 Will the USAEC explain the relationship of the Competition and the selection criteria for the IDIQ?

ANS: IDIQ will evaluate experience, capability and cost. We likely won't separately evaluate autonomy. The IDIQ contract will require unmanned operation. Teleop is required; autonomy will add productivity.

2.1.1.8 Will you provide cost data for range clearance services that are competitive today? This is requested so we will know if our automation is cost effective for the IDIQ.

ANS: Yes. We can provide money and time to perform the various range clearance tasks.

2.1.1.9 Is there any possibility that the IDIQ RFP would be restricted to small business?

ANS: Yes. See FAR available on the internet for small business requirements.

2.1.1.10 Will the IDIQ contract be a MATOC or SATOC?

ANS: Market research will dictate.

2.1.1.11 Do you have to be involved in the prize competition to bid on the IDIQ?

ANS: No. The prize competition will provide an avenue for demonstrating past performance.

2.1.1.12 Are you going to be looking for night operations on a UXO site?

ANS: Yes. Range schedule, economy. Range schedules often limit day light access yet provide free access at night.

2.2 Questions Related to the Competition

2.2.1 Competition Goals

2.2.1.1 Any thought on funding upfront costs and lowering the prize?

ANS: Funding cannot be provided up front to lower the costs to competitors. Unlike the DARPA challenges, which did provide funding to selected competitors, a contract may be awarded to one of the competitors in this prize competition. Though the IDIQ award is a separate action from the competition, the Government is not allowed to fund an effort that may ultimately be submitted in response to a procurement action. TO help alleviate the cost burden to competitors the Qualification Trials to be held at Camp Guernsey have been cancelled and replaced by an In-Process Review at the competitor team site.

2.2.1.2 Can you publish the reports documenting the work, production, lessons learned, what worked and what doesn't, strategies used, etc.?

ANS: There is be a public release approved document available online at www.roboticrangeclearance.com that captures prior work AFRL has done in this domain.

2.2.1.3 If existing tele-op systems are already more cost-effective than manual system, why require autonomy in the competition? Shouldn't tele-op be allowed to compete?

ANS: Tele-operated systems are invited to participate in the competition. However, the competition is to advance technology and find a balance between the tele-op systems that are now available and more autonomous approaches that increase cost effectiveness, productivity, and safety. We believe the R2C2 Rules and Metrics document reflects this.

2.2.1.4 It appears to me that an autonomous robot would still require the same amount of "handlers" as a teleop capability, i.e., more expensive but no savings in manpower. So, why the push for autonomous?

ANS: The Government believes there are significant savings in automated robotics operations.

2.2.1.5 The competition should be designed either for a FUDS type clearance, a range clearance, or a range construction mission.

ANS: The competition will be designed to simulate a range clearance operation.

2.2.1.6 Is there a preference to a single vehicle vs. multiple vehicles to complete the tasks?

ANS: No.

2.2.1.7 AFRL has supported projects in MMR, Honey Lake, Ft. Bliss, etc. If the USACE can simply request AFRL to perform a clearance somewhere, why or how could the private sector compete with that? Eventually autonomy in operations will be attained by AFRL.

ANS: AFRL performs R&D and conducts experiments in Autonomous Range Clearance. AFRL does not compete with industry for range clearance.

2.2.1.8 Will the teams and their competitors be publicly announced?

ANS: We expect to announce the competitors.

2.2.1.9 Taking into consideration the current political and economic environment-What impact or risk will the announcement of the administration's decision to send an additional 30 thousand troops into Afghanistan have on this effort, i.e., schedule slip; loss of identified funding, etc., keeping in mind that this troop increase is not in the current budget. So the military and Congress will have to find money to support and typically look to sourcing through cuts to programs either ongoing or new programs/efforts.

ANS: OSD and DA G-3 have committed as long as we have competitors.

2.2.2 Competition Rules

2.2.2.1 Are we considering GPS denied areas as a consideration in the scoring?

ANS: Robust solutions are desired but performance will be measured, not GPS denied specifically.

2.2.2.2 Interactions per acre or per time?

ANS: Interactions will be measured during the entire operation. No association between interactions and acreage has been established. See R2C2 Rules and Metrics document.

2.2.2.3 In the business there is enhanced teleops—automated. Will teleop be prohibited?

ANS: Tele-op is not prohibited.

2.2.2.4 Will we pick a site that matches what a team intends to do?

ANS: There will be a common geophysical mapping range for all competitors in that category. Other sites will be assigned based on the categories the competitor team intends to perform in.

2.2.2.5 On vegetation - how are you to rate vegetation removal by size of equipment and level of autonomy? An expensive high production compared to several inexpensive low capability units?

ANS: It will be evaluated on productivity, capability, and effectiveness.

2.2.2.6 How will competitors be judged? Example, under vegetation clearance is clearance rate more or less important than amount of material removed. For example, if I can leave large trees in place, I may be able to do it quicker.

ANS: Competitors performance will be judged on the end state achieved in relation to the performance requirement.

2.2.2.7 You have stated that each competitor will have a different area to clear at Camp Guernsey. Will these areas be mapped ahead of time so that you know what is there? Otherwise, how will you evaluate vehicle performance at that location?

ANS: Yes. Sites will be surveyed ahead of time.

2.2.2.8 Will foreign clearance companies be allowed to participate as a sub-contractor to a US prime contractor?

ANS: Yes, pending legal review and approval.

2.2.2.9 Is the sensor suite for mapping and marking specified? Can you describe it, or what are the characteristics of ordnance, i.e., metallic, etc.?

ANS: No, not specified. Ordnance items of interest will include 20mm to 155mm and are metallic.

2.2.2.10 Why is marking with flags separate from excavation for an autonomous robotic system?

ANS: Marking is no longer a part of the competition. See current R2C2 Rules and Metrics.

2.2.2.11 How large an area for vegetation clearance? What is comms range? LOS? Frequencies? Will there be comms deconfliction? What will be the slope?

ANS: The exact size of the area is TBD. The communication range will depend on the communication strategy created by the competitor team. No personnel will be allowed within the exclusion zone of 870M. Line of site is not ensured. Frequencies will be requested by the competitor and de-conflicted by competition oversight primarily through geographic separation and scheduling. Based on Camp Guernsey's spectrum, bands and power limits will be suggested. Slope see R2C2 Rules and Metrics doc.

2.2.2.12 Can we change the 3000 feet exclusion to say 3000 feet from the operational equipment as opposed to 3000 feet from the perimeter?

ANS: Yes. See current Rules and Metrics doc. This rule now states 870 M from the robot.

2.2.2.13 How many shifts per day?

ANS: The competitor team will establish how many shifts per day. R2C2 is not specifying. Teams will address this in their operational safety plan. Any shift duration deemed to be unsafe will be addressed.

2.2.2.14 Will we be given a chance to give them a return home function if comms are lost?

ANS: See R2C2 Rules and Metrics doc. The "Loss of Communications Stop" rule requires that the system halt and cease operations. Communications can be regained and operations resumed. If a team proposes a retro-traverse, please tell us and we will consider it.

2.2.2.15 Define range perimeter?

ANS: For the purposes of the competition the range perimeter is the work space boundary for the performance task. See R2C2 Rules and Metrics doc.

2.2.2.16 JGRE JAUS compatibility?

ANS: It is not required.

2.2.2.17 How does the ESCIP focus on UXO classification apply to the geophysical mapping component of the prize competition?

ANS: Competition and rules focus on deployment of the sensor, not evaluation/classification of the data.

2.2.2.18 Driver is cheaper, safer (?). If someone is to bring a teleop system will they be able to compete.

ANS: Yes. Tele-op can compete.

2.2.2.19 Does monitoring equate to human interaction?

ANS: No

2.2.2.20 Will duration of interaction be measured?

ANS: Yes

2.2.2.21 Define payload? Driving or buck ops is payload? (?)

ANS: There is no specific reference to payload in the R2C2 Rules and Metrics doc. This question is unclear but seems to ask if there is a difference in interaction weighting between driving and bucket operations. It is the intent of the competition to capture all human interactions and level of interaction with the systems.

2.2.2.22 Would a pre-range walk count:

ANS: as a human interaction – No

ANS: as a function of time – Yes

ANS: what if you gathered data on the walk around and uploaded the data? Uploading is an interaction

2.2.2.23 Will competitors be allowed to perform a range walk prior to employing their system for any/all categories?

ANS: Yes

2.2.3 Competition Procedures

2.2.3.1 Can you publish the reports documenting the work, production, lessons learned, what worked and what doesn't, strategies used, etc.?

ANS: There is a public release approved document available online at www.roboticrangeclearance.com that captures prior work AFRL has done in this domain.

2.2.3.2 Will competitors have access to area prior to run?

ANS: Yes.

2.2.3.3 What will be the slope?

ANS: Terrain will vary from relatively flat to sloping up to 45% with interspersed ravines, ditches, rocks.

2.2.3.4 Communications de-confliction?

ANS: Will be included in the packet. Will cover test, entire band, wattage will be constant, will need advance notice of requirements. De-confliction shall be accomplished through geographic separation and through scheduling.

2.2.3.5 Will communications be line of sight or indirect?

ANS: Line of site is not ensured.

2.2.3.6 Foreign national visitor approval?

ANS: Foreign national visitors must comply with Camp Guernsey site physical security requirements which will include escort provided by competitor team.

2.2.3.7 Will competitors have to prepare and submit workplans and safety plans?

ANS: Yes.

2.2.3.8 EM 385-1-97 and other DoD publications state that when mechanical means are utilized for UXO removal, the maximum fragmentation distance will be observed as an exclusion zone, i.e., 155mm HE projectile + 2,577 feet. Will an exclusion zone be established for personnel standoff distance?

ANS: Yes. For the purposes of the competition the exclusion zone is 870M from the system.

2.2.3.9 What is the expected range of (LOS/NLOS) operation?

ANS: LOS is not ensured. The competition does not specify your comms solution.

2.2.3.10 Limit on the number of competitors?

ANS: No.

2.2.3.11 How many competitors to move forward? 2-3?

ANS: OSD will decide.

2.2.3.12 Will Competition documents be available in the public domain? For example, Competition rules, Qualification results, Evaluation criteria.

ANS: Yes.

2.2.3.13 Can we get an example GIS.DQM.SMP (sp?) file package from Guernsey to review and consider in planning and design?

ANS: Yes. This has been requested based on the anticipated competition site.

2.2.3.14 Spectator area?

ANS: Maybe. The R2C2 plans to establish a spectator area if the resources are available to safely establish one.

2.2.3.15 Sponsors: are you going to make this a media event so sponsors will care?

ANS: Yes.

2.2.3.16 Will frequencies in 5-6 GHz be available?

ANS: Camp Guernsey cannot make any frequencies “available” as the Wyoming National Guard is not a communications regulatory authority. There are no users on Camp Guernsey in that band. A brief license search with the FCC turned up no local licenses in that band except at 5.9452 GHz. Assuming your operating compliance with FCC regulations there is nothing that would restrict your use of frequencies in the 5-6 GHz range.

2.2.3.17 Can you provide a section in the FAQ that records questions asked but yet to be answered so we know the question has been received?

ANS: Yes. If R2C2 feels that the question is a duplicate of one already received and answered no attempt will be made to capture the new question. In short, we expect that a competitor has reviewed the latest version of the Q&A to determine if their question has already been answered before asking a new question.

2.2.3.18 How will we know the teams have lost comms?

ANS: We will simulate loss of comms to test and confirm the system is compliant with rules.

2.2.3.19 Applies to loss of either E-stop comm and (?)?

ANS: “Loss of communication” is the loss of all communication with system.

2.2.3.20 Fire extinguishers in each vehicle?

ANS: We are not requiring fire suppression systems on the competitor systems. Fire extinguishers will be available at Camp Guernsey for team and pit areas. Teams are encouraged to bring their own extinguishers. The potential of a fire will be addressed by teams in their safety plan.

2.2.3.21 Halon required on the vehicle?

ANS: No. See above.

2.2.3.22 What are the qualifications of the safety officer? Will they be required to be UXO (?)...

ANS: The team will be responsible for determining qualifications. UXO teams are not required.

2.2.3.23 If remotely 3000 feet away, how will you know the boundary?

ANS: We will provide GIS.

2.2.3.24 Will accurate mapping and contour be provided?

ANS: Teams will be given a GIS data package for their competition site. R2C2 intends to determine the accuracy of the mapping data via ground truth survey and make that data available to competitors.

2.2.3.25 Can they fly UAVs first?

ANS: The anticipated competition sites are within the restricted airspace R-7001 at Camp Guernsey. There is no restriction in the rules regarding UAS operations but competitors will be required to comply with UAS regulations. Please provide the R2C2

oversight with more information as soon as possible to discuss the use of UASs by teams. It should be noted that there are no prepared airfield capabilities within R-7001.

2.2.3.26 Civilian manned aircraft ... (?).

ANS: The anticipated competition sites are within the restricted airspace R-7001 at Camp Guernsey. There is no restriction in the rules regarding civilian manned aircraft operations but competitors will be required to comply with Camp Guernsey flight regulations. Please provide the R2C2 oversight with more information as soon as possible to discuss the use of manned aircraft by teams.

2.2.3.27 If all systems to be used in the competition are fully functional and in operational mode at active installations, do we have to participate in the qualification trials?

ANS: The Qualification Trials have been cancelled and replaced by an In-Process Review. See R2C2 Rules and Metrics doc.

2.2.3.28 How do you expect robot operations to begin at 3000 feet?

ANS: See R2C2 Rules and Metrics document.

2.2.3.29 What about hard cord connection?

ANS: There is nothing in the R2C2 Rules and Metrics Document that precludes cable control operations.

2.2.3.30 Could you provide more explanation on what the competitive field generally may look like?

ANS: Yes. When the sample GIS data package has been prepared we will include photographs and general site description.

2.2.3.31 How accurate is GIS, slope, etc.?

ANS: Undetermined. Camp Guernsey has GIS data that has not been “ground truthed” in the competition site yet.

2.2.3.32 Range footprint for DGM site?

ANS: Will be survey on total station and that data will be available.

2.2.3.33 What altitude does the installation own?

ANS: Camp Guernsey’s restricted airspace R-7001 dimensions are in the public domain. The altitude that the installation “owns” depends on what tier of R-7001 is activated.

2.2.3.34 Will packet of lessons learned be made available for review? When? Will the package be posted to the web site?

ANS: Yes. They are available at www.roboticrangeclearance.com

2.2.3.35 The statement was made that the decision to allow an inspection of the performance has not been made. My suggestion would be to allow a site-walk consistent with an inspection of the range area prior to a procurement. The benefits include visual recognition of hazard areas or avoidance features. Would a site-walk of this nature be allowed?

ANS: Yes.

2.2.3.36 Who is liable for a fire?

ANS: The competitors will be responsible to meet the guidelines they have established in their safety plan. If those have been met the installation will be liable.

2.2.3.37 Not to change profile. Does this include the sub-surface task?

ANS: Yes. The tolerances are provided in the R2C2 Rules and Metrics doc.

2.2.3.38 Will the geophysical mapping area be located in open terrain where GPS signal is attainable?

ANS: Yes.

2.2.3.39 How does the 300 foot exclusion compare to the 3000 feet exclusion?

ANS: Removed. See latest R2C2 Rules and Metrics doc

2.2.3.40 Will you expect the system to look for and avoid UXOs during brush cutting operations?

ANS: Not at this time.

2.2.3.41 How will we be judged? Time, production, quality?

ANS: See Rules and Metrics Doc. The three major judging categories are Task Performance, Level of Human Interaction, and Man-hours.

2.2.3.42 Are unit operating costs going to be evaluated as part of the prize competition?

ANS: No.

2.2.4 Competition Procedures (GFE)

2.2.4.1 More on GFE – Geophysical sensors as GFE?

ANS: No.

2.2.4.2 ARTS GFE with attachments?

ANS: ARTS only.

2.2.4.3 ARTS equipment and robotic support GFE?

ANS: ICD and maintenance support.

2.2.4.4 Excavator, dozer, etc. GFE?

ANS: No.

2.2.4.5 Do you have an idea of how many ARTS vehicles would be available as GFE?

ANS: We said 9 at Industry Day. It is highly unlikely that anyone will get one for the whole time much less two. It will depend on the level of interest.

2.2.4.6 Superday?

ANS: There will be a media event scheduled for the competition.

2.2.4.7 Flail or range master will a 10-15% growth rate (?)

ANS: If the growth rate is outside of the surface grade change limit of 15cm there will be penalties assessed.

2.2.4.8 The OSD is mandating at least two mobilizations of the equipment to the test site. First for the qualification and the second for the competition. Given the cost of equipment mobilization and since the primary purpose of the qualification is to verify the equipment meets the competition published safety requirements will OSD consider the following: 1. Have the evaluation team travel to the competitors site to view equipment and perform the qualification or: 2. Allow competitors to skip the qualification phase and work at their risk up till the competition. At which time the competition committee will inspect equipment in two phases. Phase one is on the trailer. If the equipment does not meet requirements it is not unloaded until meets standard or rejected completely. Phase 2 is operational test. Again if the equipment does not meet requirements and cannot be promptly modified it is disqualified without further testing/evaluation. It will be the competitor's responsibility to promptly remove the equipment from the test site?

ANS: R2C2 has considered this and has cancelled the Qualification Trials and replaced them with an In-Process Review at the competitor's site. See R2C2 Rules and Metrics.

2.2.4.9 If a company is and has known capabilities are they required to physically attend the qualification round or can they submit a video of systems?

ANS: The Qualification Trials have been cancelled and replaced by and In-Process Review.

2.2.4.10 Will the seeded range that you perform DGM work?

ANS: The seeded geophysical mapping range will utilize buried industry standard objects. See R2C2 rules and Metrics doc for more information.

2.2.4.11 Would that be the same that we'll perform removal action on?

ANS: The geophysical mapping range that is to be used for the geophysical mapping task score is not the same as the surface or subsurface removal sites.

2.3 Unanswered Questions

2.3.1 Questions related to the IDIQ

2.3.1.1 Is there a guarantee of funding for IDIQ?

ANS:

2.3.2 Competition Goals

None

2.3.3 Competition Rules

2.3.3.1 How many acres will be clear cut for vegetation removal?

ANS: TBD. This will depend on the number of competitors in this category.

2.3.3.2 For competition, what will be the mass required to be lifted?

ANS: TBD.

2.3.3.3 How fast do tasks need to be completed? What is the time limit on the competition?

ANS: TBD. This will depend on the number of competitors and available resources.

2.3.3.4 If they fly a manned vehicle, how does this affect the scoring?

ANS: TBD. At a minimum this will affect time.

2.3.4 Competition Procedures

None