Techwerx Joint Assessment of Resilience in Vulnerable Infrastructure Systems (JARVIS) Opportunity Informational Webinar Transcripts
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GDO JARVIS Informational Webinar January 6, 2025

Haley Harrison, TWX:

Hello, everyone. Thank you so much for taking the time to watch this webinar. Just a few quick announcements before we begin. Today's webinar is pre-recorded and will be posted for archival viewing on the Techwerx website. We're very excited to host this informational webinar for the Joint Assessment of Resilience and Vulnerable Infrastructure Systems in the Grid or “JARVIS” opportunity funded by the Department of Energy's Grid Deployment Office.

Scan the QR code in the corner to go to the website and find any additional information. Next slide, please.

My name is Haley Harrison. I am with Techwerx. We're an innovation hub managed by RTI International in support of the Department of Energy. The goal of Techwerx is to facilitate academic, federal, nonprofit, small business connections across the United States. To hear about new opportunities as they come up, or any updates on the GDO JARVIS specific opportunity, we recommend following our page on LinkedIn, as well as signing up for our newsletter via a link on our website.

Today, we have James Briones and Andrea Thorstensen joining us from the Grid Deployment office at the Department of Energy. With that, I'm going to pass it over to the Grid Deployment Office to cover the details of the JARVIS Opportunity. Next slide, please.

James Briones, DOE GDO

Thank you. I'd like to get it started. Hello, everyone. I'm James Briones. I'm leading the Reliability, Risk and Assurance Programs in the Department of Energy's Grid Deployment Office.

For those of you who are unfamiliar with GDO, it's a relatively new office within the Department of Energy. GDO’s primary mission is modernizing America's energy grid.

And as everybody knows, it's a critical step to towards a secure and sustainable energy future. So, this modernization is enabled by the Bipartisan Infrastructure Law and the Inflation Reduction Act and involves like significant investment. For your information, our division alone has ownership of 10 billion dollars invested in upgrading our energy infrastructure.

For those of you who are familiar, our flagship program, called the Grid Resilience and Innovation partnership is already delivering results. There’s hundreds of projects

nationwide that are improving grid reliability and resilience, and it's demonstrating a lot of tangible progress.

Looking ahead, though, on this webinar, we recognize the growing threat of extreme weather to rich stability and resilience. We are launching this JARVIS initiative. As mentioned earlier, JARVIS is a 35-million-dollars investment. It utilizes advanced technologies and data modeling to proactively identify and mitigate vulnerabilities. This program will enhance grid resilience, improve integration of diverse energy resources and ultimately provide a greater assurance of reliable energy supply for all Americans.

Now, I'll introduce you guys to Dr. Andrea Thorstensen. She's a climate scientist with extensive experience and operational forecasting and in the academic world as well, to give you further details on JARVIS initiative.

Dr. Thorstensen leads this important program for us. Andrea.

Andrea Thorstensen, DOE GDO

Go ahead, and I'll go to the next slide, please. So, James did a nice overview of our missions and goals at GDO and the Department of Energy. So, I'm going to go ahead and jump right into this particular opportunity, the JARVIS initiative. So go ahead next slide, please.

So, the primary goal of the JARVIS initiative is again to bolster that grid resilience and reliability. We're casting a fairly wide net in terms of how applicants can contribute to the goal of this initiative. So, work related to hardening against extreme weather, using data, analytics and smart grid technologies to improve flexibility and integration of distributed energy resources. These are all efforts that would fit nicely into the JARVIS framework.

And of course, this needs to be a strategic approach, so, incorporating that cost, benefit analysis view, and those real-world testing elements are going to help us ensure efficient deployment and address those growing energy demands.

This initiative is broken up into 3 Theme areas of technical assistance. And we'll step through each one of these Themes. And within these Themes we have topics that fit under each of these. So, in general, we're looking at understanding and predicting grid performance, identifying and mitigating grid vulnerabilities and strategic planning and execution for grid resiliency. So next slide, please.

So, our applicants themselves will be the utilities paired as a team with their technical assistance provider of their choosing. So, the actual application will be sent by the utilities themselves, but they're going to be supported in this effort by a technical assistance provider. As James mentioned, this opportunity has 35 million dollars available.

We're looking to fund projects for up to about a million dollars each. So, thinking about 35 to 40 projects. Roughly, if we were to follow that 1-million-dollar allocation. There is a 20% cost share requirement for application components that include R&D elements, but that cost share only applies to elements of a project that are identified as R&D. So, for example, if a project were to be funded for a million dollars, but only 100 K was flagged as R&D, the cost share, then, would be 20 K for that particular project. The timeline for we're looking at for these projects to take place is on the 6-to-24-month timescale. And all utilities are welcome as applicants. DOE does have an interest in supporting the smaller electric utilities defined as selling less than 4 million megawatts. However, that shouldn't discourage larger utilities, and certainly does not disqualify larger utilities from applying as well. Next slide, please.

So again, our 3 Themes of technical assistance under the JARVIS initiative are understanding and predicting grid performance. This is done through data analysis and modeling. Theme 2 is identifying, mitigating grid vulnerabilities, focusing on that risk, assessment and vulnerability, evaluation piece, and then Theme 3 is strategic planning and execution for grid, resilience, planning, implementation and compliance. Now, when we walk through these 3 Themes, we're going to have topics under each of these, and there are projects that could fit in any or all Themes. Theoretically, while we're looking at this applicants are able to apply to topics across Theme 1, or topics that are in either Theme 2 and/or 3. So as we're stepping through each of the individual topics, we'll keep that in the back of our minds next slide, please.

So, jumping right into Theme 1, we're looking at the understanding and predicting grid performance through data analysis and modeling. So, this is a data driven approach to focus on improving grid performance and understanding prediction, utilizing advanced analytics, modeling and climate data. To get at those accurate simulations. We have those 3 topics within Theme, one advanced data analytics and modeling digital twin development, climate data and guidance. So, there may be a project that will fit one or all 3 of these topics, and that is perfectly acceptable. Next slide, please.

All right. So, the first Topic under Theme 1 is Advanced Data Analytics and Modeling. So, we're looking at those cutting-edge data analytic techniques to really dig into grid operational data. So, anything from statistical methods, machine learning or other innovative tools that can identify patterns, look at potential failures and perform optimization. This will fit nicely under topic one Theme one. Looking for predictive models that will incorporate historical and predicted weather information to subsequently simulate grid behavior under different extreme weather conditions.

That would be a major deliverable of this particular topic area. Now, as we continue to step through these topics, I'll point to the right side of the screen in the green. There's a list of example milestones that are included for each topic area. These are examples, only they're meant as a guide. They're no means prescriptive, but it should give you an idea of what type of milestones you might want to include in an application. If you were to focus on one of these topic areas. Next slide, please.

Under Theme 1 again, our Topic 2 is Digital Twin Development. This is where we're looking for these highly detailed replicas of either specific infrastructure components or entire systems within the grid. So, we want these interactive digital representations of the physical system to do different types of test cases, whether you want to look at how the grid responds to extreme weather events, maybe a cyber-attack or specific equipment failures. We can safely test that in the digital realm and then inform what we should do in the real world. So, of course, a deliverable for this topic would be a digital twin model that would work. And then it's been validated and tested against physical data. So, it needs to be built, functioning, and then kind of run through the gamut on that it actually works. Compared to real world data. Next, slide, please.

Topic 3 under Theme 1 is Climate Data and Guidance. So, this topic is focused on really digging into the nitty gritty of available climate data for a particular area. This could be variables that are relevant to utilities that we've proposed here: changes in temperature, precipitation, wind speed, but any climate variable that would have an impact on a utilities operations would be of interest. So, we want to look into, where are there data gaps? And where is there reliable data? How can we dig into the available sources and identify what's missing. So, deliverables in this case would be a comprehensive assessment of climate hazards relevant to those particular utilities. And then any recommendations for addressing data gaps. If you really find that we're missing a big chunk, how can we address those data gaps in the future, and of course, incorporating those climate projections into the grid resilience planning. Next slide, please

Moving on to Theme 2, our Theme 2 is Proactively Identifying Grid Vulnerabilities, Evaluating Risks and Developing Resilience Strategies to Mitigate Potential Failures. So, we've got 3 topics under Theme 2, we're looking at risk assessments and resilience strategies. Failure mode studies and accelerated lifetime testing and asset exposure and vulnerability. Next slide, please.

So, the first Topic in Theme, 2 Risk Assessment and Resilience Strategies, we're looking at comprehensive risk assessments for specific grid assets or systems. Looking at the highly localized data, this might include looking at historical weather events and then tailoring these resilience strategies to these identified vulnerabilities. So, this may be a case where

you have a specific event that was highly impactful. You want to do some back testing to see what would happen if that particular event were to hit your particular area. So, this includes things like risk, assessment, resilience strategies, and then prioritizing what resilience measures should be implemented. Next slide, please.

Topic 2. Under Theme 2 is Failure, Mode Studies and Accelerated Lifetime Testing. So, this topic focuses on comprehensive failure, mode and effects analysis techniques to find where those failure points could be within grid components. So, we're looking at analytical studies and accelerated lifetime testing to try to get at the durability of those critical grid equipment under specific conditions. So, we want to find, where can we improve the design, operation, maintenance of specific equipment and enhance its resilience and overall lifespan. So, a deliverable in this case would be analysis of those potential failure modes and recommendations for improving component design and maintenance practices. Any accelerated lifetime testing that is done, we would want to see those results as well. Next slide, please.

Topic 3 under Theme 2 is Assets, Exposure and Vulnerability. So, this topic, we're looking at those in-depth evaluations of vulnerabilities both at the component and at the asset level. We're looking at individual components under various threat conditions. So, this could go back to extreme weather conditions, or we could be considering cyber-attacks as an example. So, these will inform development of those targeted mitigation strategies. Deliverables for this topic, we're looking at comprehensive inventory lists of critical assets. finding out where those assets are most vulnerable, and then using that to create this prioritization framework for resilience investments. Next slide, please

Onto Theme 3, we have 3 topics again, under our final Theme that is, Investment Planning, Real World Testing and Simulations and Environmental and Sustainability Standards Support. Next slide, please.

All right. Our first Topic under Theme 3 is Real World Testing and Simulations. So, this is where a project might use something like a microgrid or another controlled portion of in the environment to test out some new technologies or strategies before going all in and deploying large scale. Again, looking at this effective evaluation of proposed solutions before going all in on deployment. So, a deliverable in this case would be, are the data and results from the real-world testing, or those micro grid results and assess the performance and efficacy of those resilience measures. Next, slide, please.

Topic 2 under Theme 3 is Investment Planning. This is really focused on prioritizing investments of grid hardening and resilience measures.

So, this is where we really want to see detailed cost, benefit analysis frameworks, both on the economic side. So, the dollars and also the societal value of these resilience improvements. We're looking for prioritization of our effective investments. Deliverables in this case will include cost benefit analysis. And then any supporting documentation and rationalization for the prior prioritization of the projects. Next slide, please.

Finally, Topic 3 is Environmental and Sustainability Standards and Support. So, this is the one that will really help our applicants navigate the sometimes complex landscape of environmental regulations and also support the integration of sustainability measures into resilience planning efforts. Deliverables we would be looking for in this topic are guidance on complying with the environmental regulations, recommendations for integrating sustainability into resilience planning, and then the documented compliance with standards. Next slide, please.

All right, when we go to review our applications, we're looking at 3 main criteria. The most weight will be going on to technical merit. 30% will go to technical approach and management capabilities. And then 10% on the dissemination and impact side next slide, please.

So, the bulk of the evaluation, 60% will be focused on the technical merit piece. So, we're really looking for how has the project demonstrated the potential to improve grid resilience for the customers relevant to an applicant described baseline. So, we're asking for you to describe where you're at now, what kind of problems you're facing? What are the potential outcomes of the project. And how does this all align with GDO goals. Next slide, please?

30% of the score will be the technical approach and management capabilities. So, we're looking at how well scoped is the project. Does it seem feasible? Do we have potential stumbling blocks identified and forward thinking, and how we would overcome those stumbling blocks. Is the project supported by a robust team structure and management. Can the folks do what they say they're going to do? So, we're looking for that type of planning as well. Is the budget well thought out? And, has thought been put into the timeline as well. next slide, please.

And then 10% will go to how will this particular project benefit beyond this particular project? So how will we get shared with the broader industry. So, looking for benefits beyond the immediate beneficiaries of the project and next slide.

Haley Harrison, TWX

The submission deadline for this opportunity is April 18th at 5 PM Eastern Standard Time. We suggest aiming for an earlier submission to avoid being pressured at the last-minute changes so that we can work through all of those things ahead of time. We're going to be

hosting additional office hours or Question and Answer sessions March 12th at 2 PM Eastern Time, and a second one April 9th at 3 PM Eastern time. Please stay up to date by checking the opportunity page for the latest information.

To wrap up, if you have any questions, please reach out to us. You can contact us on the contact form on the website, or send an email to info@Techwerx.org. All of this information is on our website on the opportunity page, including the dates and everything we've shared here. So, thank you all for watching and taking the time to join us today to talk about JARVIS and thank you very much.