From: rlm52@comcast.net
To: Norma Garcia Santos; "Mike Rose"
Cc: Yoira Diaz Sanabria; Kristina Banovac; Jason Piotter
Subject: [External_Sender] RE: RE: QUERY-Follow Up RAI-TH-5, Model No. IR-100ST, Docket No. 9385
Date: Thursday, January 15, 2026 11:29:27 AM

Hi Norma, following is our draft response to your question. Please review and let me know if you have any questions. If you find it satisfactory, please let me know the next steps you'd like us to take. Thanks, Ron

Here is a draft response:

To clarify RAI-TH-5, the 18650 lithium power cells, which are located outside of the welded stainless-steel package, may be stored at a temperature range of -40 °C (-40 °F) per the manufacture, LithiumWerks. As noted in the NRC's question, the temperature ranges for discharging and charging the power cells are -30 °C – 60 °C (-22 °F – 140 °F), and 0 °C – 60 °C (32 °F – 140 °F), respectively. LithiumWerks also notes that the charging current at < 40mA when under 0 °C (32 °F) for "some applications", compared to < 50mA at 3.6 V. Since the reported low storage temperature for the lithium power cells is -40 °C (-40 °F), the effect of the low temperature has no effect on the shielding safety function for the IR-100ST package. Note that CTU-2, which included the lithium power cells, was exposed to dry ice (-109 °F, -78°C), as noted in SAR §2.6.2, to pre-condition the package for the HAC cold free drops. As demonstrated by the CTU-2 pre- and post-shielding test results, there was no effect from the -40 °C temperature exposure on the IR-100ST's ability to maintain the shielding safety function.

From: Norma Garcia Santos <Norma.GarciaSantos@nrc.gov>
Sent: Tuesday, January 13, 2026 1:39 PM
To: rlm52@comcast.net; 'Mike Rose' <miker@ir100.com>
Cc: Yoira Diaz Sanabria <Yoira.Diaz-Sanabria@nrc.gov>; Kristina Banovac <Kristina.Banovac@nrc.gov>; Jason Piotter <Jason.Piotter@nrc.gov>
Subject: RE: RE: QUERY-Follow Up RAI-TH-5, Model No. IR-100ST, Docket No. 9385

Good afternoon,

I appreciate it.

Feel free to contact me if there are any questions.

Thanks,
Norma

From: rlm52@comcast.net <rlm52@comcast.net>
Sent: Tuesday, January 13, 2026 4:08 PM
To: Norma Garcia Santos <Norma.GarciaSantos@nrc.gov>; 'Mike Rose' <miker@ir100.com>
Cc: Yoira Diaz Sanabria <Yoira.Diaz-Sanabria@nrc.gov>; Kristina Banovac <Kristina.Banovac@nrc.gov>; Jason Piotter <Jason.Piotter@nrc.gov>
Subject: [External_Sender] RE: QUERY-Follow Up RAI-TH-5, Model No. IR-100ST, Docket No. 9385

Hi Norma, Mike is out for another week or so but I forwarded your question to our engineer for review and response.

Thanks,
Ron

From: Norma Garcia Santos <Norma.GarciaSantos@nrc.gov>
Sent: Tuesday, January 13, 2026 12:53 PM
To: Mike Rose <miker@ir100.com>; rlm52 <rlm52@comcast.net>
Cc: Yoira Diaz Sanabria <Yoira.Diaz-Sanabria@nrc.gov>; Kristina Banovac <Kristina.Banovac@nrc.gov>; Jason Piotter <Jason.Piotter@nrc.gov>
Subject: QUERY-Follow Up RAI-TH-5, Model No. IR-100ST, Docket No. 9385

Good afternoon, Mr. Mike Rose,

The response to RAI-Th-5 needs clarification. It appears the response is saying that the package containing the LiFePO4 power cells will not be adversely affected when exposed to a temperature of -40 deg C (-40 deg F) if the LiFePO4 power cells are not operating.

-/ However, information in the SAR (e.g., section 3.3.1 and elsewhere) indicates that the power cells operate during transport. The application noted that cell charging has a 2.5 W maximum power (with a 4 hour to 5 hour charging period) and occurs when the package is transported within an enclosed secure transport box in an enclosed transport vehicle. In addition, the SAR refers to the battery datasheet (reference 1.2.1 of the application), which mentions a charging temperature range of 0 deg C to 60 deg C and a discharging temperature range between -20 deg C to 60 deg C. [These temperature ranges are slightly different (but similar) to the temperature ranges provided in the RAI response. These temperature ranges were taken from the on-line battery specification sheet.]

-/ 10 CFR 71.43 tells us that a package must be designed so there is no reduction in

package effectiveness during NCT (hot and cold) and 10 CFR 71.71 mentions a cold temperature of -40 deg C.

-/ The purpose of the RAI was the behavior of the lithium batteries during cold transport. The response does not address the impact if the power cells are operating at cold temperatures (e.g., -40 deg C), which are outside the above-mentioned temperature ranges (e.g., 0 deg C to 60 deg C as well as -20 deg C to 60 deg C). Literature indicates, for example, that charging at low temperatures can lead to adverse thermal reactions.

-/ Based on the temperatures listed in the battery specification sheet, a CoC condition can be included that refers to the two temperature ranges.

Please provide a response by email and let me know if you would like to discuss this question and response over a phone call.

Thanks in advance,

Norma Garcia Santos
Project Manager
U.S. NRC
Email: Norma.GarciaSantos@nrc.gov
Phone No. 301-415-6999