New Energy Times

June 17, 2018

Bernard Bigot
Director General, ITER
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Dear Dr. Bigot,

A global misrepresentation of the projected results from the ITER fusion reactor has occurred. Your organization has been a leading participant in this deception.

On May 1, 2017, I began writing to you about the numerous false and misleading statements about power input and output on the ITER organization Web site.

You did not arrange for your staff to make any corrections until I published the 300 MW electrical input power value for the ITER reactor on Oct. 6, 2017. Your organization still does not publish this value on its Web site.

After I published the value for the projected electrical power consumption for ITER, you arranged for multiple corrections to falsehoods that were on the ITER organization Web site. However, several misleading statements remain. I list them on the following pages.

I encourage you to arrange for corrections to the statements on the ITER organization Web site so that ITER power claims are described accurately and transparently for your public audience.

Kind regards,

Steven Krivit
Publisher and Senior Editor, *New Energy Times*

URL: https://www.iter.org/ (Text with gallery image #2)

STATEMENT: "Designed to produce 500 MW of fusion power for 50 MW of input heating power (a power amplification ratio of 10), it will take its place in history as the first fusion device to create net energy."

ISSUE #1: We each know exactly what is meant by "fusion power." But you don't explain this to the public when you make the above statement on your home page. Instead, you lead the public to perceive that the reactor, rather than the plasma, will produce a tenfold gain. This is misleading.

According to its design specification, the ITER reactor is expected to produce about the same amount of power as put into the reactor. The projected gross thermal output power is 500 MW. The projected input electrical power is 300 MW. The projected output power will be 1.8 times more than the input power. But this is not the most accurate way to compare output to input. This calculation does not compare apples to apples. A more accurate method to compare the output to input is to convert the reactor's thermal output power (~500 MW) to the equivalent electrical output power at 40% efficiency. Using this method, the ITER reactor will not generate any net power. (Please see the detailed values and graph in Appendix A.)

ISSUE #2: Input heating power consumed is designed to be 150 MWe. The 50 MWth value only applies to the projected injected thermal power. The current statement does not make this distinction clear, and in fact misleads readers to which value the 50 MW applies.

URL: https://www.iter.org/proj/inafewlines

STATEMENT: "In 1997, JET produced 16 MW of fusion power from a total input heating power of 24 MW (Q=0.67). ITER is designed to produce a ten-fold return on energy (Q=10), or 500 MW of fusion power from 50 MW of input heating power."

ISSUE #1: The total input heating power for JET was about 75 MWe. The injected thermal power for JET was 24 MWth. The current statement does not make this distinction clear, and in fact misleads readers to which value the 24 MW applies.

ISSUE #2: JET could not produce 16 MW of power from 24 MW of injected thermal power alone. JET required 700 MW electrical input to produce that 16 MW. The current statement does not transparently communicate the input required for that JET result to readers.

ISSUE #3: The total input heating power for ITER is designed to be 150 MWe. The injected thermal power for ITER is expected to be 50 MWth. The current statement does not make this distinction clear, and in fact misleads readers to which value the 50 MW applies.

ISSUE #2: ITER will not be able to produce 500 MW of power from 50 MW of heating power alone and thus potentially misleads readers. ITER will require 300 MW of electricity to produce that 500 MW.

URL: https://www.iter.org/factsfigures

STATEMENT: "ITER has been designed for high fusion power gain. For 50 MW of power injected into the Tokamak via the systems that heat the plasma it will produce 500 MW of fusion power for periods of 400 to 600 seconds. This tenfold return is expressed by Q ≥ 10 (ratio of heating input power to thermal output power). The current record for fusion power gain in a tokamak is Q = 0.67 held by the European JET facility located in Culham, UK, which produced 16 MW of thermal fusion power for 24 MW of injected heating power in the 1990s."

ISSUES: Same issues as described above.

URL: https://www.iter.org/sci/Goals

STATEMENT: "In 1997, JET produced 16 MW of fusion power from 24 MW of power injected into its heating systems (Q=0.67). ITER is designed for much higher fusion power gain, or Q ≥ 10. For 50 MW of injected heating power it will produce 500 MW of fusion power for long pulses of 400 to 600 seconds."

ISSUES: Same issues as described above.

URL: https://www.iter.org/sci/Goals

STATEMENT: "ITER is designed to produce a ten times return on invested energy: 500 MW of fusion power from 50 MW of input power (Q=10). It will be the first of all fusion experiments in history to produce net energy."

ISSUE: Same issues as described above.

URL: https://www.iter.org/sci/BeyondITER

STATEMENT: "JET, which succeeded in generating 16 MW of fusion power, for 24 MW of power used to heat the plasma (a Q ratio of 0.67). Scientists have now designed the next-step device—ITER—as a Q≥10 device (producing 500 MW of fusion power for 50 MW consumed by the heating systems)."

ISSUES: Same issues as described above.

URL: https://www.iter.org/fr/ (Text with gallery image #2)

STATEMENT: "le tokamak ITER sera la plus grande et la plus puissante des machines de fusion jamais construites. Conçue pour amplifier d'un facteur dix la puissance qui aura été apportée à ses systèmes de chauffage (50 MW ➔ 500 MW) elle sera la première à générer une production nette d'énergie."

ISSUES: Same issues as described above.

URL: https://www.iter.org/fr/proj/inafewlines

STATEMENT: "Le record de puissance de fusion produite est détenu par le tokamak européen JET. En 1997, cet tokamak a généré 16 MW de puissance de fusion pour une puissance de chauffage totale de 24 MW. Ce ratio (ou « Q ») de 0,67 devrait être porté à 10 par ITER — 500 MW de puissance de fusion pour une puissance en entrée de 50 MW. ITER étant une machine expérimentale qui ne fonctionnera pas de manière continue, l'énergie produite ne sera pas convertie en électricité. Cette étape sera réalisée par la machine qui lui succédera."

ISSUES: Same issues as described above.

URL: https://www.iter.org/fr/factsfigures

STATEMENT: "Le programme de fusion ITER poursuit un double objectif: obtenir un gain énergétique net et préparer le futur réacteur de démonstration. ITER a été conçu pour produire 500 MW d'énergie pour des périodes de 400 à 600 secondes à partir d'un apport externe de 50 MW, c'est-à-dire pour générer dix fois plus de puissance qu'il n'en aura reçu ($Q \geq 10$). Le record de puissance de fusion, détenu par le tokamak européen JET (Culham, Royaume-Uni), est de 16 MW pour 24 MW apporté ($Q = 0.67$)."

ISSUES: Same issues as described above.

URL: https://www.iter.org/fr/sci/goals

STATEMENT: "Le record de puissance de fusion produite est détenu par le tokamak européen JET. En 1997, ce tokamak a généré 16 MW de puissance de fusion pour une puissance de chauffage totale de 24 MW. Ce ratio (ou « Q ») de 0,67 devrait être porté à 10 par ITER—500 MW de puissance de fusion pour une puissance en entrée de 50 MW, pendant des périodes de 400 à 600 s, la première machine capable de produire une une quantité d'énergie nette. ITER étant une machine expérimentale qui ne fonctionnera pas de manière continue, l'énergie produite ne sera pas convertie en électricité. Cette étape sera réalisée par la machine qui lui succédera."

ISSUES: Same issues as described above.