

# **The “Rossi” Energy Catalyzer reactor: needed NEW experiments for confirmation!**

**Special Short Report on, January 14-2011, demonstration at Bologna-Italy**

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## Key points

1) **The Rossi experiment is not a typical cold fusion experiment.**

Perhaps it is a completely different reaction. They used **undisclosed elements** (besides Nickel) that **could be the main sources of excess heat**. These elements are kept strictly **SECRET**.

According to rumors (and “extrapolation” of my experience), the **Nickel** is in the **nano-particle** state and is **intimately mixed with the other (key) elements**. Perhaps the trigger element is the Nickel itself (more or less loaded by Hydrogen) which is forced (by the heater) to operate close to its Curie temperature (350 °C, ferro-magnetic → para-magnetic transition and vice versa).

**2) The experiment, at the beginning, didn't start properly because the main heater had catastrophic failure.**

**\* After some (chaotic) “work” (and the large people waiting in the main room making noisy and “bitter” comments....), at the end, the reactor was started.**

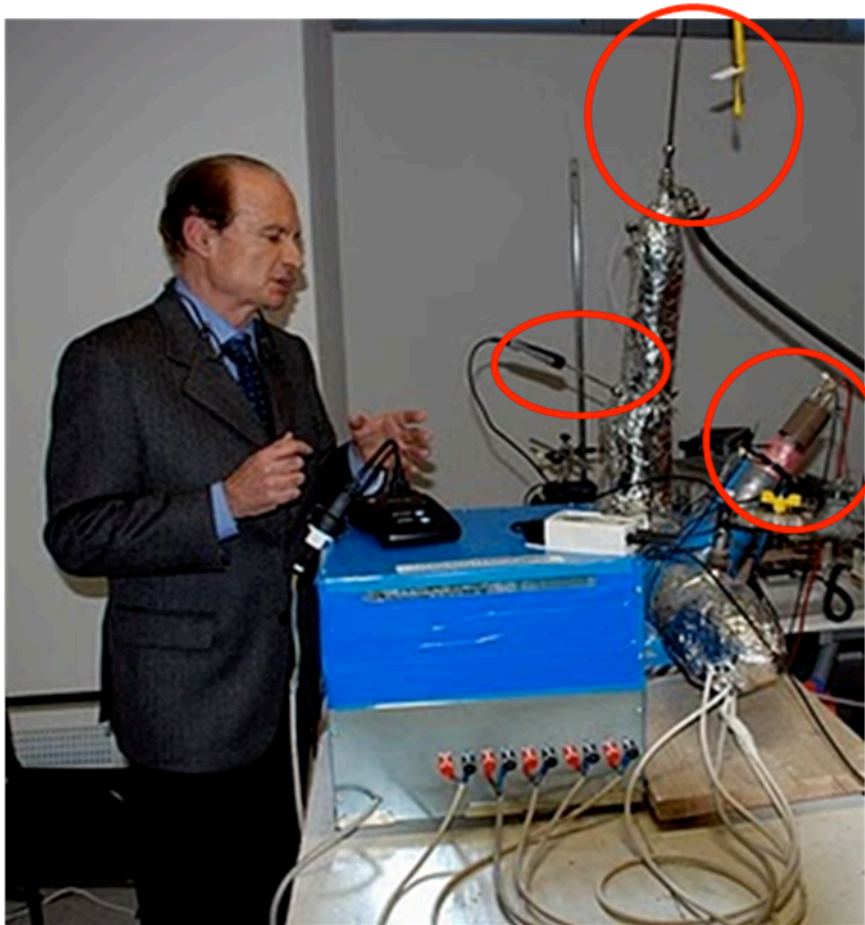
**\* The expected self-sustaining regime (input electric power strongly reduced from kW level to less than 100W), as claimed several times before by Rossi and Focardi, this time was not possible to be operated.**

**\* According to previous information, the same reactor and the same material **SURELY** worked very well all the day before (i.e. January 13, gain 100-200, self sustaining regime possible) and the **morning of January 14**, although at reduced performances (maximum gain 30-40). Moreover there was evidence of annihilation gamma ray (511 keV) but, as usual, not commensurable with the energy produced.**

## Summary

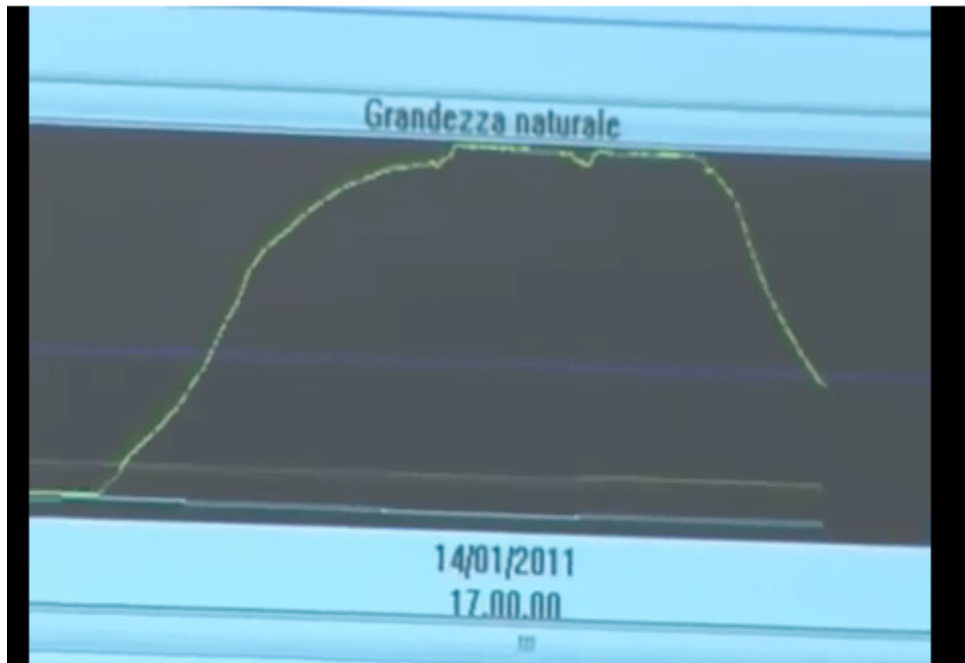
- \* **The experimental apparatus.**
  - \* **What was been reported.**
  - \* **A conceptual mistake.**
  - \* **Conclusions.**
- 
- \* **Very recent claims on 1 MW modular reactor to be ready on October 15, 2011.**

## The Experimental Apparatus



- **Hygrometric probe for steam quality measurement – not reliable – not used continuously.**
- **Thermocouple for coolant temperature measurement.**
- **Two NaI scintillators at 180° for Gamma counting.**
- **No measurements at the output.**
- **No physical evidence of high steam flow (no strong sound of whistle, just very-very noisy experimental room during operations).**

## The temperature profile



(figure taken from the official report)

- It seems that data were not fully recorded (according to Levi) due to acquisition mal-functions.
- 40 minutes of steam production claimed (~20 from the graph).

**This temperature profile can be easily explained even without assuming excess heat (e.g. with a partial evaporation of the input flow).**

## **Three separate (official) reports and my own (un-official, short time) measurements.**

**\* Thermal balance (by G. Levi).**

**Very little information, incomplete measurements, questionable assumptions (like complete evaporation).**

**A new, in deep, report promised by Rossi.**

**\* Dosimetry (by D. Bianchini:**

**Good report, but not significant signals, in the mean, above the background.**

**\* Gamma detection (by M. Villa).**

**Very detailed report, but no signal above the background, in mean. Villa demonstrates that he would have certainly measured gammas if they were present accordingly to the Focardi theory ( $>10^{11}$  photons/s expected at this power level).**

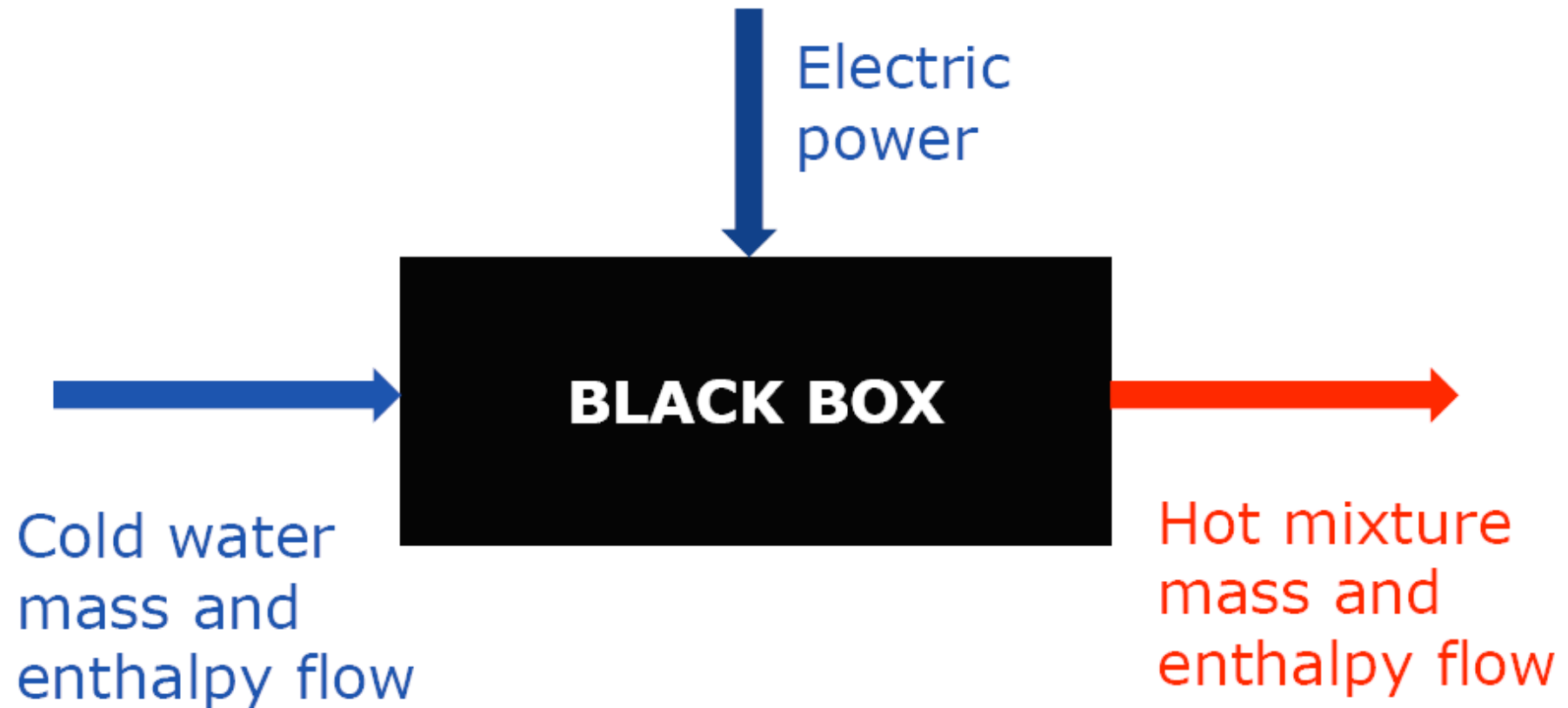


- **My own measurements using NaI(Tl) 25-2000 keV gamma spectrometer (by Berthold), battery operated.**
- **Before starting the experiment the NaI counts were the same in both the main room and experimental room (about 60 cps). As spectrometer, it was calibrated by  $^{137}\text{Cs}$  gamma source.**
- **During the experiment the main room counts remained the same, but in the experimental room, close to the reactor, counts fluctuated between 60-120 cps. In view of the safe levels of radiation, I “moved” the detector from counts to spectra. Sadly Rossi, once realized my changing, refused to allow these measurements and I was forced to cancel the data recorded. My measurements took place over 3 minutes only.**
- **During the open discussion, after the experiment, I made a bitter comment about such episode and the television recorded it (it is possible to watch it even by YouTube).**

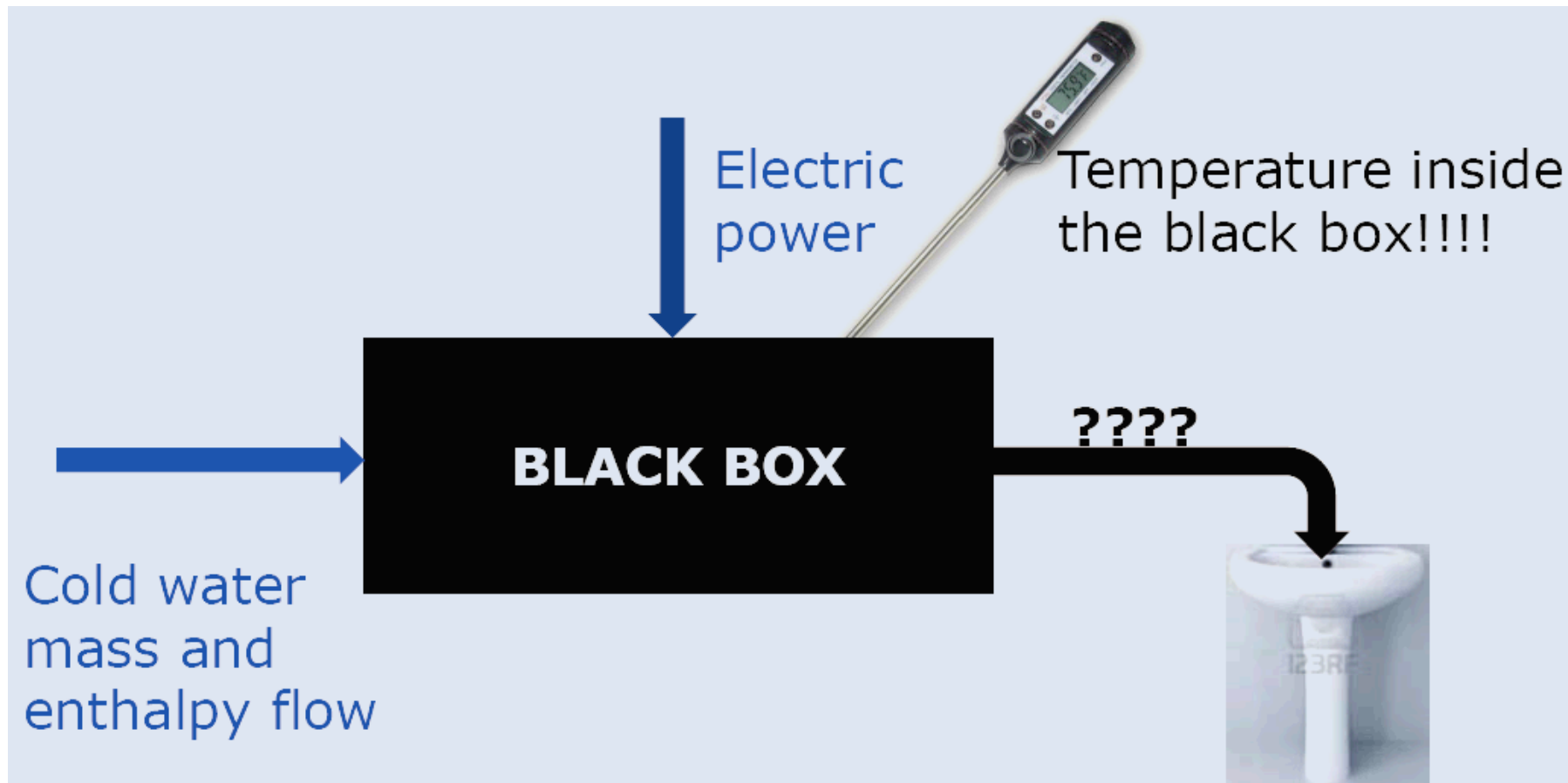
- \* According to Rossi, if the spectra of X-gamma emissions from the reactor, although weak in such specific experiment, will be acquired and recorded, their “origin” can be identified by expert people. As a consequence, all his patents rights (not fully accepted at the moment) and general economic agreements with several Company, will be damaged for ever.
- \* The reactor was shielded (according to Focardi) by (about) 1 cm thick Pb. I wasn't allowed to verify the shielding thickness and kind of material adopted.
- I used also one handy Geiger counter (used by firemen), ELF (extremely low frequency electromagnetic detector) and RF (up to 2GHz) detectors, all battery operated. No large signals detected. *Only the Geiger counter, and gamma detector, gave simultaneously ONE strong spike few minutes after starting the heater.* Such (interesting) effect wasn't repeated on switching off (at the same intensity).

The conceptual mistake in the energy balance.

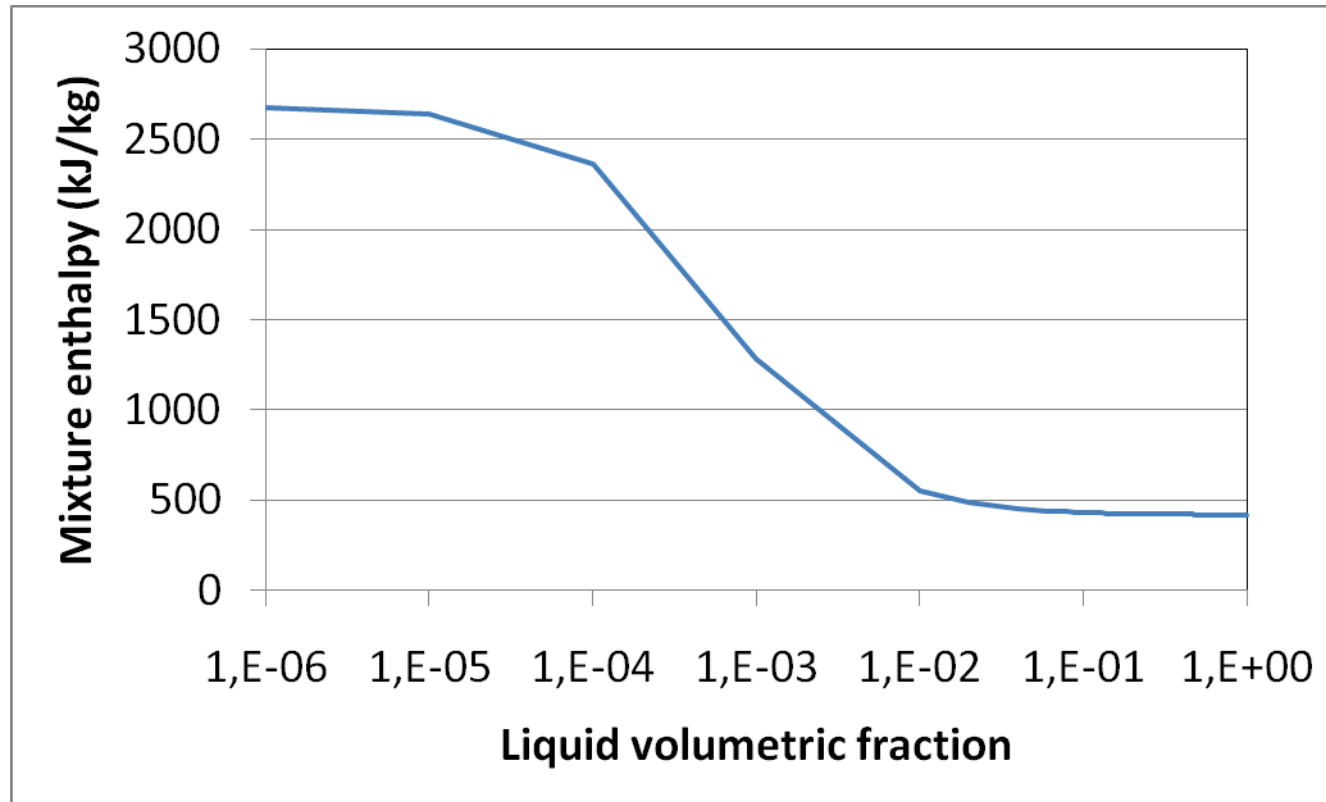
What should have been measured...



**The conceptual mistake in the energy balance  
...and what was actually measured**



**Accurate measurement of liquid entrainment is essential.**



**With just 1% of liquid volumetric fraction the mixture enthalpy is just a bit higher than the pure liquid.**

## Conclusions

- Several claims done during the experiment are not supported by measurement logs.
- The official report does not include measurements details.
- A conceptual mistake is present in the experiment design: not all terms in the energy balance are measured.
- There was no physical evidence of a large steam flow (no strong whistle!).
- No traces of macroscopic radiation were detected.

**The experiment has to be repeated ASAP.**

We suggested several times (privately, in public, by the BLOG) to use conventional flow calorimetry at  $T_{\text{out}} < 90^{\circ}\text{C}$  to avoid the difficulties, and doubts, of steam regimes.

## **Very recent claims by Rossi**

**On January 31, 2011, Rossi sent a mail to all the CMNS community where he said that on**

**October 15, 2011**

**he will show a working reactor able to give an output energy of about 1 MW.**

**The “power reactor” will be made by assembling, in series and parallel, 100 modules of 10 kW each, similar to that shown at Bologna.**

**It is not quoted the input energy needed.**

**The reactor will be assembled/tested in USA and sent to Europe (Greece?).**

**We hope that, the next time, all will operate properly.**

