

Secretariat of the Control Committees  
Parliament Building  
CH -3003 Bern

[Address of Signatory]

[5 February 2011]

Dear President Roth-Bernasconi, dear President Janiak, dear members of the Control Committees

On behalf of the Heavy Ion Alert network I would like to request that the Control Committees investigate the following two issues:

- 1) Whether heavy ion collisions at the Large Hadron Collider are capable of producing strangelets, that could pose a threat to Switzerland and the world.
- 2) Whether the Federal Assembly was misinformed about the independence and objectivity of the committee responsible for the current safety assessment of the LHC.

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Issue 1 - Strangelet Production at the LHC

Attached to this text is a recent report by Eric Penrose from the board of Heavy Ion Alert. It reviews the safety arguments concerning strangelets presented by CERN and accepted by the Federal Council. The report contains a review of CERN's arguments and demonstrates how they are contradicted by statements in the scientific literature, as well as by statements of scientists from CERN and by CERN's own actions.

Strangelets are a form of matter which was hypothesized by physicists to explain a phenomenon observed in cosmic rays. Throughout the '80s and '90s there were numerous attempts by physicists to produce both positively and negatively charged strangelets through collisions at particle accelerators. These attempts were conducted fairly openly and within the physics community there was a great deal of excitement about the possibility of creating a completely new form of matter.

In the year 1999 - following the publication of a short scientific article by the later Nobel laureate Frank Wilczek which mentioned that strangelets could conceivably threaten the planet, there was widespread public concern about whether the generation of such objects could be potentially dangerous.

Experts closely associated with the largest of these experiments, the 'Relativistic Heavy Ion Collider' (RHIC) in New York and the 'Large Hadron Collider' (LHC) in Geneva, quickly assured the public that there was no great risk, and they stated that such experiments should be allowed to continue.

The possibility of strangelet production at the LHC was reviewed at length in the report of the 'LHC Safety Assessment Group' (LSAG) which was released on June 20th, 2008. The issue of strangelets was considered in section 5 of the main report and in a special addendum devoted exclusively to strangelets. The unanimous conclusion of the LSAG's report was that it would probably not be possible to produce strangelets at the LHC. This conclusion is repeated on CERN's website, which states:

‘Strangelet production at the LHC is therefore less likely than at RHIC, and experience there has already validated the arguments that strangelets cannot be produced.’

On the other hand, the LHC has a specialized detector, called CASTOR, which has been designed specifically to identify and study strangelets, which could be produced in heavy ion collisions.

Even the ‘ST’ in ‘CASTOR’ [CentauRO And STRange Object Research] proves its official function. This contradicts CERN's claim that ‘strangelets cannot be produced’. Scientists responsible for this detector have predicted production rates on the order of 1 strangelet per 1000 collisions at the LHC, which over the lifetime of the experiment would mean the creation of 10,000,000 strangelets.

Although this is a technically complicated and highly specialized field, one does not need to be a physicist to recognize the obvious contradiction between CERN's claim that strangelets cannot possibly be produced and the statement of its scientists that strangelets could be produced in large numbers. Thus far, no attempt has been made by CERN to resolve this contradiction. Criticism regarding this has been ignored and the experiment started anyway.

Just as disturbing is the silence of many physicists associated with the LHC. In the December 2007 edition of ‘CMS Times’ (the internal newsletter of the ‘[Compact] Muon Solenoid’ collaboration), a Greek physicist speaking on behalf of the CASTOR detector [project] plainly stated that strangelets would probably be produced at the LHC. Just six and a half months later CERN's official safety report claimed that previous experiments at lower energies proved that it is impossible for strangelets to be produced. It is therefore a legitimate expectation that the physics community would publicly demand a clarification of these contradictory views. So far, physicists associated with CERN and the LHC have kept quiet about this issue in public.

The reality of this situation is that governmental oversight of this project has been inadequate. If the member states of CERN permit the organization to assert something which is quite obviously false, there is effectively no control over the project, and CERN is free to do whatever it wishes, regardless of the consequences.

The special responsibility of our country in this matter becomes evident when one considers that all other countries expect us to play a key role in the regulation of the LHC. In a letter ‘Heavy Ion Alert’ recently received from the U.S. Department of Energy it was stated that:

‘After a detailed application process, operation of the LHC has been approved by the nuclear regulatory authorities of the host countries, Switzerland and France.’

This official statement from the Government of the United States clearly demonstrates the responsibility that we bear in this matter for the entire world. It should be ensured that the risks associated with the LHC are accurately and responsibly assessed.

Aside from the main question of whether strangelets can be produced, the attached report also documents the following contradictions in CERN's official statements about the safety of the LHC:

\* CERN claims that the risk of strangelet production at the LHC would be lower than at previous colliders, whereas scientists working at CERN say that the probability is greater.

\* CERN claims that a particular model for strangelet production has now been abandoned for the LHC, whereas scientists operating experiments there, consider that same model to be one of the most likely pathways for strangelet production.

- \* CERN claims that negatively charged strangelets - according to the latest state of knowledge probably the most dangerous type - are extremely unlikely, whereas scientists that collaborate with CERN are predicting the production of negative strangelets at the LHC.
- \* CERN claims that it is very unlikely that small strangelets could be stable or long-lived, but scientists at CERN report various ways in which even small strangelets could be stable.
- \* CERN claims that nuclear collision experiments and observations of cosmic rays have not yielded any evidence at all for the existence of strangelets, but scientists working at CERN refer to significant experimental evidence for their existence.
- \* CERN claims that naturally-occurring cosmic ray collisions demonstrate the safety of the LHC, even though scientists working at CERN state that the heavy ion collisions at CERN 'can be expected to show exotic phenomena that is beyond the reach of cosmic rays'.

The details of these contradictions are presented in the attached report, which also provides direct links to the original quotations and documents. Any further evidence or documentation required by the Control Committees, we will readily provide.

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## Issue 2 - Independence or dependence of the LHC Safety Assessment Group (LSAG)

A central issue bearing on not only the risk of strangelet production but also the risk of other dangerous effects of the LHC is the question of whether the project's official safety report was prepared by an objective and independent committee.

The Federal Council has assured the Federal Assembly that the committee responsible for the safety report was an independent one. On 26 November 2008, in response to a question submitted by National Council members Vischer, Bänziger, Daguet, Frösch, Gilli, Hämmerle, Lang, Leuenberger, Schelbert, Schmid-Federer, Steiert, and Teuscher, the Federal Council stated the following:

de

'Gerade weil es auch der Cern-Rat als absolut zentral angesehen hat, die möglichen Risiken im Zusammenhang mit dem Betrieb des LHC genau zu kennen, hatte er das Cern-Management in dessen Bestrebungen unterstützt, den Sicherheitsbericht aus dem Jahr 2003 im Lichte neuer experimenteller Ergebnisse und eines vertieften theoretischen Verständnisses auf den aktuellen wissenschaftlichen Stand zu bringen. Das Cern hat daher dieses Jahr die Arbeitsgruppe Sicherheit am LHC, WELCHE AUS CERN-UNABHÄNGIGEN EXPERTEN ZUSAMMENGESETZT IST, mit dieser Aktualisierung beauftragt.' (Hervorhebung hier hinzugefügt)

fr

'Le conseil du CERN a lui aussi considéré qu'il était capital de connaître les risques potentiels inhérents à l'exploitation du LHC; c'est pourquoi il a soutenu la direction du CERN dans ses efforts pour mettre à jour le rapport de 2003 sur la sécurité à la lumière de nouveaux résultats expérimentaux et d'une approche théorique approfondie. Le CERN a confié, en 2008, l'actualisation de ce rapport à un groupe de travail "Sécurité du LHC" COMPOSÉ D'EXPERTS INDÉPENDANTS DU CERN.' (Mise en relief ajoutée)

it

'Peraltro, riconoscendo l'importanza di individuare con esattezza I rischi potenziali legati all'uso dell'acceleratore LHC, il consiglio del CERN ha sostenuto la direzione dell'organizzazione nel suo

impegno per aggiornare il rapporto sulla sicurezza del 2003 alla luce di nuovi risultati sperimentali e di conoscenze teoriche più approfondite. Nel 2008 il CERN ha quindi affidato l'aggiornamento del rapporto al gruppo di lavoro "Sicurezza dell'acceleratore LHC", COMPOSTO DI ESPERTI INDEPENDENTI dall'organizzazione.' (l'evidenziazione è nostra)

[en]

'Precisely because the CERN Council also regards it as absolutely essential to accurately understand the possible risks involved in the operation of the LHC, it has supported the efforts of CERN's management to update the 2003 safety report to the current state of scientific knowledge in the light of new experimental results and a deeper theoretical understanding. CERN has therefore this year [2008] mandated the LHC Safety Assessment Group, WHICH IS COMPOSED OF CERN-INDEPENDENT EXPERTS with this updating.' (Emphasis added)

The LSAG group was composed of the following scientists:

- \* John Ellis (senior member)
- \* Michelangelo Mangano (spokesperson)
- \* Urs Wiedemann
- \* Gian Giudice
- \* Igor Tkachev

If one examines the background of each of these physicists, it becomes clear that not one of them can be considered independent.

\* John Ellis - A brief glance in Wikipedia reveals that Prof. Ellis has been employed at CERN since 1978. It is also noteworthy that he has twice been the Deputy Division Leader of CERN's theory division, and for six years has been the leader of this division. He is also deeply involved in the recruitment and integration of a number of non-European states into the LHC. In addition to the information available on Wikipedia, the minutes of the LHC Committee (LHCC) meetings show that Professor Ellis has been a member of that Committee from its inception until the spring of 1997. Altogether, Professor Ellis has dedicated more than 25 years of his life to the LHC project. By no standards can he be considered an independent and disinterested party for an assessment of the LHC's safety.

\* Michelangelo Mangano - Dr. Mangano joined CERN in 1995 and is presently a 'Senior Member' of the organization's theory division.. For more than a decade before the release of the LHC's safety report, Dr. Mangano had officially participated on behalf of CERN in discussions about the physical discoveries anticipated from the LHC. Like Professor Ellis, Dr. Mangano has also been a member of the LHCC – the central body for the management of the LHC. Dr. Mangano has been a member of that committee from 2001 until the present. As with Professor Ellis, Dr. Mangano also cannot be considered an independent and disinterested party.

\* Urs Wiedemann - Prof. Wiedemann has been a member of CERN's theory division since 2000, with specialization in the physics of particle accelerators and in heavy ion physics. Professor Wiedemann is one of the organizers of the 'CERN Heavy Ion Forum' and was a leading member of the ALICE collaboration. As a CERN employee and an active participant in LHC activities, he cannot be considered independent.

\* Gian Giudice - Dr. Giudice has been a member of CERN's theory division since 1993. His career has always been closely associated with collider research. Before he came to CERN he had worked at Fermilab, and had worked together with Prof. Steven Weinberg [during] the construction of the 'Superconducting Super Collider'. Apart from the fact that his status as an employee of CERN means that he cannot be considered an independent party, one can immediately see from the first chapter of his recently published book about the LHC that Dr. Giudice hardly possesses the objectivity expected from a person responsible for as serious a task as the independent assessment of the safety of the LHC.

\* Igor Tkachev - Prof. Tkachev was a member of CERN's theory division from 1999 until the publication of the first version of the LSAG safety report. Prof. Tkachev also has a permanent position with the Institute for Nuclear Research in Moscow. The existence of this longstanding affiliation does not change the fact that he is a long-term associate of CERN and participated in the LSAG as a member of CERN's theory division.

On the basis of these facts, it is clear that this group can in no way be considered an independent committee. For this reason alone it is appropriate that collisions at the LHC be suspended until a thorough and independent review of the project has taken place.

To put this issue in a wider perspective, it is worth noting the words of law professor Eric E. Johnson in his published critique of the legal aspects of the LHC's approval and operation:

'It is remarkable to think for a moment how CERN's situation might be viewed if, instead of operating a particle accelerator, CERN was a developer of pharmaceuticals. If a pharmaceutical firm attempted to take a drug to market based on the safety assessment of a panel of five of its employees, who in turn relied on the scientific work of one employee and one other scientist with a pending visiting position with the firm—it would be a scandal of epic proportions.' (Original paper attached.)

Just as serious is the question of how the Federal Council could have the audacity to claim that this committee is independent when, quite obviously, that is not the case. In addition to the physical risks that the LHC still poses, this issue highlights a grave political risk which can be considered as a threat to our democracy. When honourable members of the Federal Assembly submit a question to the Federal Council, they rightly expect – and also deserve – an honest answer. However great the disagreements about the political paths and priorities of the Government may be, the factual accuracy of the Federal Council's answers should never have to be called into question. In this case we are faced with not just a minor error, but a completely false representation of a fact of the utmost importance.

We further note that the Federal Council incorrectly informed the Federal Assembly when it said:

de

'Der entstandene Bericht wurde danach vom Scientific Policy Committee überprüft und von einem Panel von fünf unabhängigen Wissenschaftlern bewertet.'

fr

'Le rapport a été validé par le Comité de politique scientifique et évalué par un panel de cinq scientifiques indépendants.'

it

'Il rapporto atualizzato è stato verificato dal "Scientific Policy Committee" e valutato da un gruppo di cinque ricercatori indipendenti.'

[en]

'The resulting report was then vetted by the Scientific Policy Committee and evaluated by a panel of five independent scientists.'

As the Federal Council noted, the SPC is responsible for determining the scientific strategy of CERN. The reality was that this second panel of five persons was not a separate and additional body: it was composed entirely of members of CERN's Scientific Policy Committee (SPC). Consequently, its members cannot be considered independent parties when it concerns the assessment of the safety of the LHC. Thus far, no independent scientific media has published a single report demonstrating that the LHC poses no significant risk to Switzerland or the world.

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We trust that the Control Committees recognize the urgency and importance of the issues raised in this letter.

The possibility of strangelet production at the LHC is a profound ethical issue which must be investigated thoroughly and objectively. The attached report demonstrates that the current safety arguments related to strangelets are plainly contradicted by the statements of physicists specializing in this field. These contradictions must be examined before further increases in the luminosity or energy of heavy ion collisions at the LHC are permitted.

The question of the independence of the LHC Safety Assessment Group is central to this whole issue. The lack of an independent and objective assessment of the experiment is likely the root cause of the public disquiet about this project. What is particularly disturbing, however, is that the Federal Council had misled the Federal Assembly about the independence of both the LHC Safety Assessment Group [LSAG] and the five-member panel which subsequently reviewed the LSAG report. As a general policy, there should be no tolerance for any deception of the Federal Assembly by the Federal Council - on any issue. But in this particular case, when it comes to something as important as the survival of all, we should have no tolerance whatsoever for such false statements.

We call upon the Control Committees to undertake a full investigation of this issue and ensure that those responsible for these transgressions must publicly justify their actions.

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[Further personal statement from the Signatory]

[Name of Signatory]

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References:

Eric Penrose, 'How CERN's Documents Contradict its own Safety Assurances: Plans for "Strangelet" Detection at the LHC'  
<http://www.heavyionalert.org/docs/CERNContradictions.pdf>

Eric E. Johnson, 'The Black Hole Case: The Injunction Against the End of the World'  
<http://arxiv.org/abs/0912.5480>