
Recommissioning of Plants After Serious Events - *The Currenta Explosion Incident 2021* -

**Prof. Dr. Christian Jochum
(chr.jochum@t-online.de)**

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- **Study of chemistry**
- **1969-1979 Pharma- Research and Production, Hoechst AG**
- **1979-1997 Safety Department Hoechst AG Main Site (30.000 employees)**
 - **1988-1997 Corporate Safety Director**
- **Since 1997 freelance consultant**
- **2007-2013 EPSC Director of Centre**
- **1992-2017 Chair/Deputy of the „Commission on Process Safety“ (KAS) Consulting body of the German Federal Government (until now member of the sub-committee „Seveso-Directive“)**



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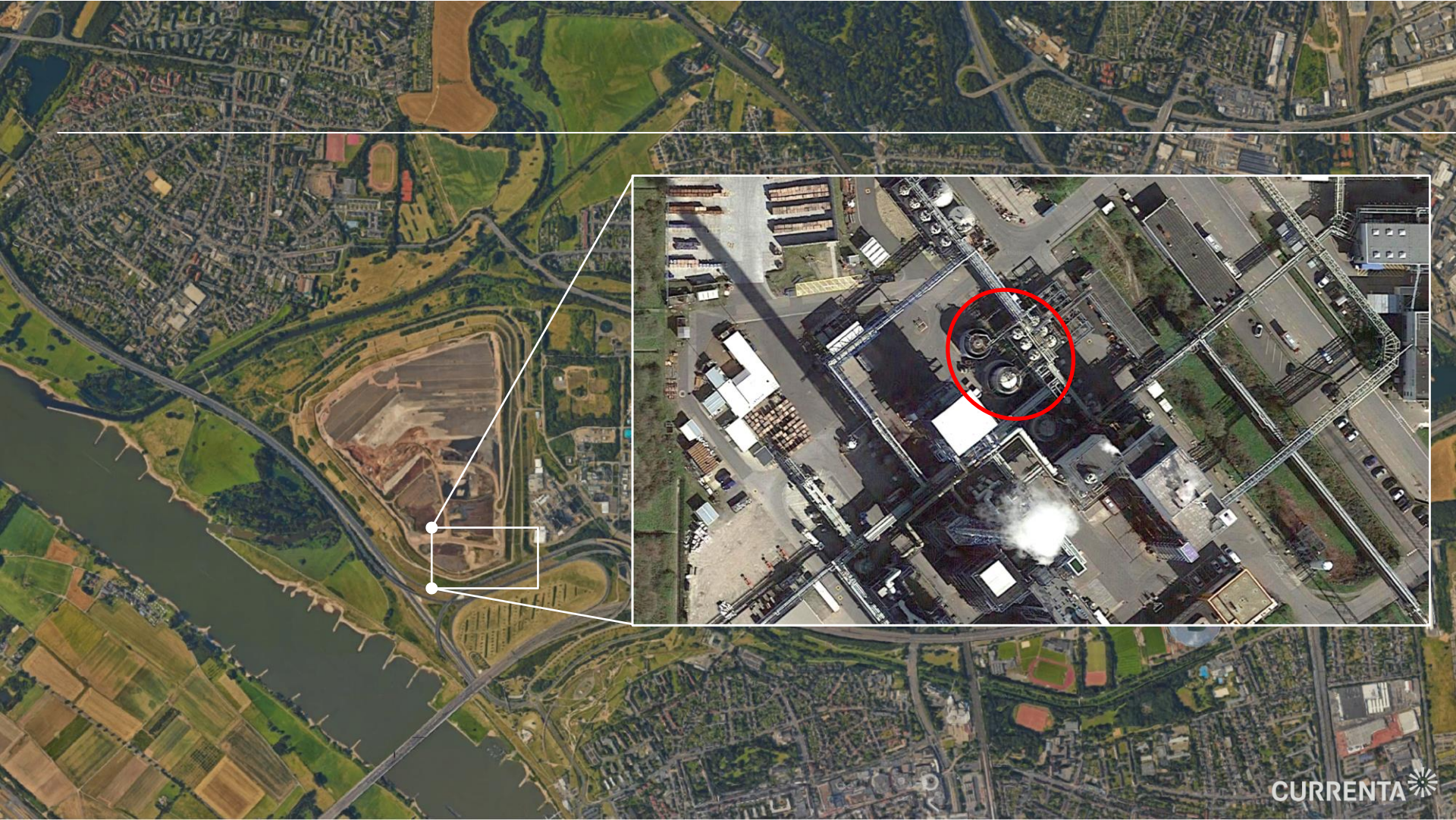
On July 27, 2021, there was an explosion and subsequent tank farm fire at the Leverkusen-Bürriq waste disposal center.

Seven people lost their lives and 31 people were injured.



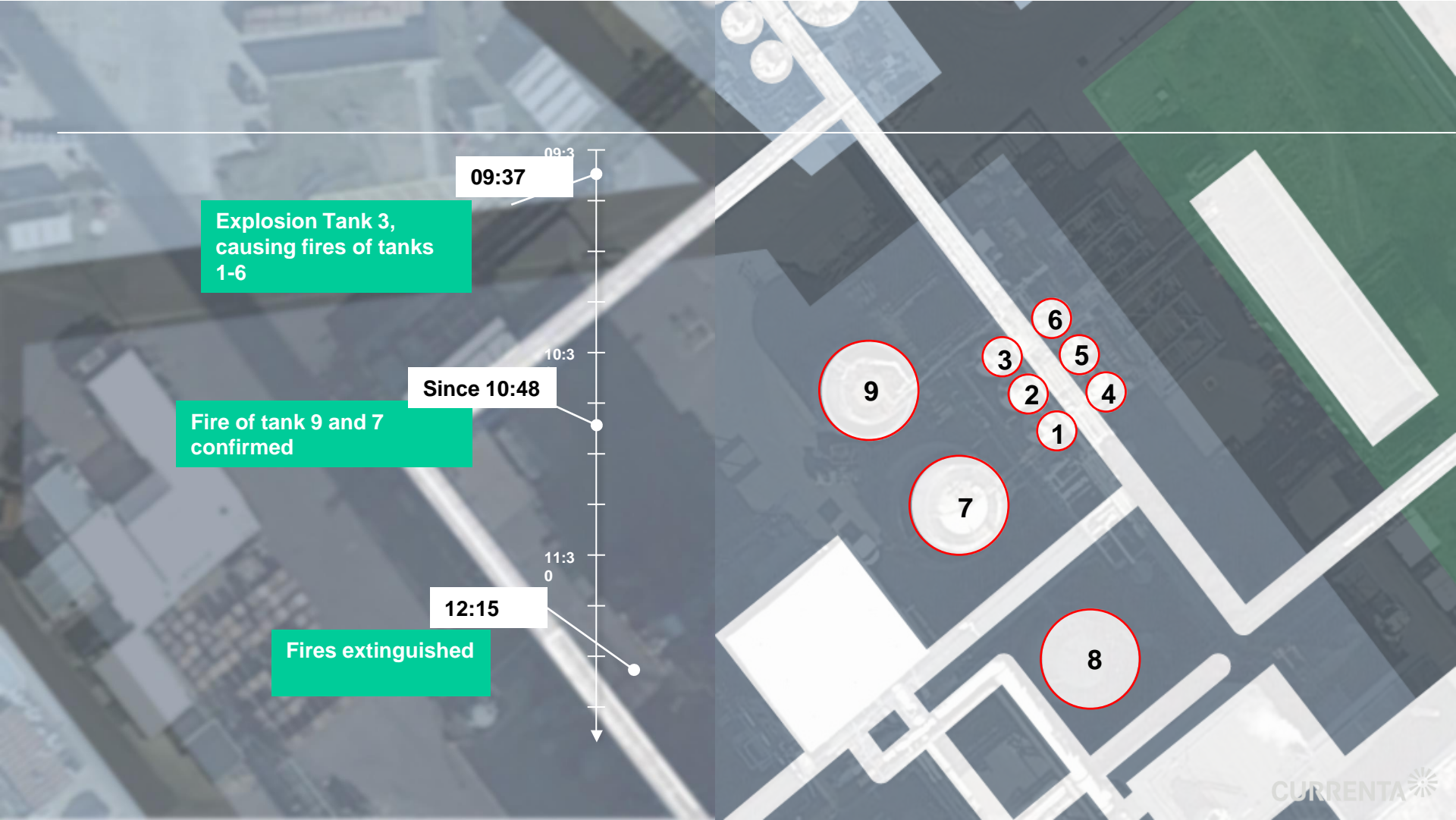
- **Liquid waste was kept in tank 3 above SADT (Self Accelerating Decomposition Temperature).**
- **Temperature was exponentially increasing due to a runaway reaction of at least one component of the waste.**
- **The rise of temperature and pressure became so fast that the tank exploded.**
- **The released waste ignited immediately.**
- **Adjacent tanks had been damaged by the explosion and set in fire, too.**
- **Seven people died, 31 people were injured.**
- **No damages in the neighborhood and for the environment.**

Leverkusen – Buerrig Waste Disposal Center



CURRENTA 

Timeline of the Incident



Emergency Response



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- **District government of Cologne City (competent authority for licensing and control)**
 - Order for a comprehensive safety inspection in accordance with § 29a BImSchG
- **Investigation by public prosecutor / criminal police**
- **Currenta**
 - Control/limitation of damage
 - Information of the public (special website for the incident after few days: www.currenta-info-buerrig.de)
 - Own investigations into the cause of the incident
 - Intensive monitoring / support of the official investigations
 - Own investigations into improvement measures (technical / organisational) in contact with Cologne district government

- **Every malfunction appears as a “major incident” (including previous and subsequent ones) and gives critics the image of an "unreliable" operator**
 - **As Currenta operates the emergency response of the whole Chempark Leverkusen, incidents of all other operators are falsely viewed as Currenta´s**
- **Neighbours were annoyed, worried, sometimes frightened, felt inadequately informed by the company ("salami tactics") and left "alone" by the authorities**
- **Environmental NGOs got involved**
- **Media reacted locally and in the case of Currenta nationally**
- **Politicians became active. In the Currenta case: Ministry of the Environment, Ministry of Economics, state parliament**
- **Re-commissioning was imperative for the company, for the functioning of environmentally sound disposal, for other companies involved and for the CHEMPARK, but partly perceived as a threat by neighbors.**

To address the concerns beyond the legal requirements, on the recommendation of the Cologne district government and the State Ministry of the Environment Currenta commissioned an additional review with focus on the following questions:

- Do the investigations formally ordered by the authorities take adequate account of possible risks and vulnerabilities?**
- Are the proposed or already implemented safety measures sufficient?**
- Under what conditions can recommissioning be justified without posing a risk to the neighborhood or the general public?**
- Are the questions and concerns of neighbors, environmental NGOs and the media adequately addressed and answered?**

This “overarching” review

- is based on the “official” expert opinion as a second opinion**
- covers issues beyond investigations formally ordered by the authorities**
- is written in a way which “informed laymen” may understand**

The additional overarching review is intended to create a new basis of trust and strengthen the precautions against incidents. This requires that

- **Reviewers are knowledgeable, independent, free of conflicts of interest**
 - **Chr. Jochum (coordination)**
 - **DNV/Jan Gramatzki**
 - **ARU Prüfenieur & Umweltgutachter/Benedikt Beckmann**
 - **Öko-Institut/Stephan Kurth**
- **Experience with reviews of this type (Comprehensive review of the Shell Rheinland refinery in 2014/2015 and targeted review since 2020)**
- **Maximum transparency through an Advisory Group with external stakeholders**

- **Purpose**
 - **Open and transparent communication about all safety issues regarding the operation of the hazardous waste incinerator**
 - **Public participation in the process of safe recommissioning**
- **Participants**
 - **Local administration and politics**
 - **Environmental NGOs**
 - **Neighbors**
 - **Media**
- **13 meetings since January 6, 2022 (online until the beginning of 2023) and a townhall meeting**
- **Expert Reports are discussed in advance in the Advisory Group**
- **Published on a freely accessible website www.begleitkreis-buerrig.de**

- **The reports focus on the different steps for recommissioning the incineration plant, although numerous recommendations are made that go beyond this.**
- **The aim of the reports is to demonstrate an extremely high level of safety.**
- **They are no classic audits to determine weaknesses, but recommendations for improvements**
- **The expert reports cover all conceivable risks and thus go beyond the targeted cause analysis by the official investigations. Therefore, all conceivable additional findings from the official investigation will be covered by the broad approach of our review**
- **The expert reports evaluate also documents that are not publicly accessible, but explained to the Advisory Group**
- **Up to now 4 expert reports plus 4 expert statements.**
- **The expert reports do not replace the responsibility of the authorities. However, they have been part of the authorities' audit basis and an important aspect in political decisions.**

Potential risks of any hazardous waste incinerator (unrelated to the specific case):

- **Self-decomposing (thermally unstable) waste**
- **Insufficient knowledge of the waste**
- **Delivery of wrong waste**
- **Insufficient monitoring (e.g. storage temperature too high)**
- **Incompatibility with (residual) substances in the tank**
- **Technical problems at the incineration plant**
- **Insufficient emergency preparedness**
- **Insufficient regulations in the safety management system**

Self-decomposing (thermally unstable) or reactive waste

- **Insufficiently covered by national and EU regulations (improvements are required and partly initiated)**
- **For the future additional tests (eg DSC) are recommended from waste producer, at incinerator's entrance control and before mixing in storage tanks**
- **Recommendation of threshold values for temperature**
- **It must be ensured that all necessary information is provided by the waste producer**

Safety Management System (SMS)

- **To minimize the risk of human failures a comprehensive risk analysis (SWIFT) was performed. By improvement of existing and addition of some new procedures the SMS became more resistant to faults**

Emergency Preparedness

- **Pre-Emergency measures depending on waste properties and temperature**
- **General observation: Consider above-ground high-voltage lines in emergency preparedness**

- **Communication at eye level**
 - **Taking neighbors' fears and concerns seriously, even if they appear to be technically and scientifically unfounded. Address the conceived and of course the "real" risks openly and at an early stage.**
 - **Official investigations and trade secrets have to be taken into account as a barrier to communication to the extent necessary.**
 - **Give the dialogue with neighbors time and respect it.**
 - **Don't try to influence who participates in this dialogue (no back-room decisions!)**
 - **Explain controversial decisions in particular. Also address the emotional level. Do not create facts in advance.**
- **Make clear: safety has absolute priority**
 - **Make expert reports transparent to the extent possible (respecting trade secrets, official investigations e.g.)**
 - **Openly address technical and economic constraints, if necessary.**
 - **Discuss suggestions from neighbors (= laypersons!) with an open mind and seriously consider to implement them.**

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Recommissioning: the potential for conflict

The company's view

- **"We have done everything to prevent a recurrence of the event"**
 - Examined by experts and authorities, some details are company secrets
- **"We can no longer wait with plant operation because ... (shareholders, contracts, function in the group, etc.)"**
 - Financial and legal risks can threaten the company's existence
 - Continued disruption of waste disposal (Currenta's incinerator is an indispensable element of the disposal system)
- **"We have a valid licence and are now using it again"**
 - May be legally correct, avoids the above-mentioned risks
 - May permanently disrupt relationships with neighbors, authorities and politicians, leading to higher expenses for PR measures and financial losses due to increased problems in licensing procedures

The neighbors' view

- **"How can they just carry on like this without the cause of the incident being fully clarified?"**
 - **The cause of the accident is often not fully communicated until years later, especially in ongoing criminal proceedings**
 - **Fears have (therefore) often not yet been allayed and trust has not yet been restored.**
- **"They don't have their systems under control"**
 - **Even minor problems are regarded as "major incidents" after serious events**
- **"It had to happen, because ... (savings, change of ownership, etc.)"**
- **"They do what they want anyway"**
 - **Intervention rights of the authorities are overestimated**
 - **Experts are paid by the company "and are therefore biased"**

The authority's view

- **“We can't please anyone anyway“**
 - **Permits are always a compromise between the protection of the neighbors and the demands of the company**
 - **Nuisances and minor risks, which legally have to be accepted, may appear threatening to neighbors**
- **"If we could do as we would like to do ..."**
 - **Not everything that makes sense in terms of safety can also be ordered (principle of proportionality)**
 - **Economic importance can influence decision-making not only on the political level, but also in authorities**
- **“For the citizen and the media, we are always the scapegoat”**
 - **The authorities' resources are limited**
 - **Not everything an authority does, can be made public**

Resumption of operation after serious incidents is more than just a legal and technical issue.

- **Pressure from the waste disposal side made it necessary to start recommissioning before the official investigation into the cause of the accident was completed. This caused substantial concerns on the part of some neighbors, some media and some politicians**
- **It had to be made plausible that all conceivable risks have been examined and can be excluded or managed.**
- **Step by step recommissioning shows high endeavours to ensure safety. 5 steps: Start in June 2022 (shortly before the first anniversary of the explosion ...), finished in 2024.**
- **Detailed expert opinions for each step, shared and discussed with the Advisory Group and published on website**
- **Taking account of the incident special focus was on issues of thermal stability.**

- **The initial situation was characterized by the shock of the serious accident.**
- **A recommissioning was met with strong reservations and even rejection immediately after the event.**
- **The additional ‘overarching’ review gave the authorities and political decision-makers additional support.**
- **The neighbors and other stakeholders were involved in the recommissioning process. Their fears and concerns were addressed.**
- **As a result, the recommissioning was largely accepted. However, some opponents of Currenta or the Chemical Park had been immune against all arguments and facts.**
- **A basis was laid for the continuation of the cooperation between the company and neighbors etc. It is now up to the company to continue along this path.**

Thank you for your attention!

Any questions?