November 7, 2008

Summary of SABIA's Root Cause Analysis concerning the incident February 29th 2008 at the Idaho Falls manufacturing facility at 2300 N. Yellowstone Highway Idaho Falls, ID 83401 bay 3 & 4.

This refers to the breached strontium-90 radioactive source at our manufacturing facility. Our findings have found several discrepancies in the NRC INSPECTION REPORT 030-35997/08-001.

The purpose of the analysis is to determine the root cause of the incident and the contributing causes in order to allow SABIA to develop a plan of action and make changes in procedures and training that will prevent a like incident from happening again.

The Process that was used was Apollo Root Cause Analysis. This was an in depth analysis which revealed a number of deficiencies in SABIA's training and procedures, including what we feel is the real Root Cause for the incident. In our opinion there were several decisions made by the investigating team, concerning what information to use, that did not let them determine the real Root Cause of the problem.

The NRC dealt with the timeline surrounding the incident. Our analysis followed the timeline and decision making process from the time that the gauge was decommissioned by SABIA for 3M in March 2001 and put in Storage for disposal. Based on the source & Device Registration for this gauge the source material was supposed to be a fused glass industrial source. There was every indication that SABIA was capable of handling this gauge and disposing of it. For this reason it was stored for Disposal.

If there had been any indication in the registration paperwork that the source material was a fine powder, the decision would have been made at the time of decommissioning to dispose of the gauge through a third party vendor. It never would have been stored and never would have been operated.

SABIA has decided not to disassemble nuclear gauges. All gauges decommissioned for customers are being and will be sent directly to third party vendors for disassembly and disposal.

Two charts are part of this report. Chart 2 shows the causes listed by the NRC and where they fall in the incident timeline. Chart 1 shows the main findings of the SABIA analysis and where those causes fall on the timeline.

The first conclusion by the NRC report is that the direct cause of the leak was caused by employee 1 directly impacting the exposed source with a screwdriver and then hitting the gauge on the table top to try to dislodge the source.

We do not disagree that this happened. However, we believe that employee 2 was standing next to employee1 when he exposed the source and left when employee 1 was dismantling the final part of the gauge. Employee 2 said specifically that he did the swipe of the source as soon as the foil was removed and the source was exposed. Employee 2 left immediately to read the wipe, and Employee1 continued working on the gauge before the results of the wipe were read. (Continuing to work on disassembly before reading the wipe violated the working procedure that had been developed.)

This testimony is acknowledged in the NRC report but the statement by Employee 2 was discarded because it conflicted with the statement by employee 1 and there was not independent verification.

A confirming reason that we believe the swipe was done first, is that employee 2 was standing right next to employee 1 when he uncovered the source. Employee 1 held the gauge while employee 2 took the swipe. To accomplish this employee 2 had to be in close contact with employee 1 and very close proximity to the gauge itself. If employee 1 had breached the source and then hit the gauge on the table with employee 2 standing right next to him, employee two would have had significant contamination on his clothes, at the very least.

This means that the gauge was in the process of leaking before it was operated by employee 1. The spread of contamination was made dramatically worse by the actions of employee 1 before the swipe was read. This type of contamination was not expected by the RSO in developing his project plan.

The Cause of the event was a leaking Sr-90 Beta emitting source that was being prepared for disposal.

The Cause of the leak was deterioration of the source during the 20 years since its manufacture, which must have been aggravated by striking it with a screwdriver. The extent of the dispersion of contamination was significantly increased by striking the source in its holder on a cardboard-covered workbench and on the metal surface of a nearby electric table saw.

ROOT CAUSE -Source & Device Registration led the reviewer to the conclusion that the strontium -90 source was a material that was in an inert, non-dispersible form in a welded stainless steel capsule . It therefore would not present a high risk of contamination. That erroneous conclusion affected the entire process of planning, preparing, and training for the source disposal effort.

Contributing Causes

Planning

1. Failure to develop, document, and implement a plan that adequately addressed all the needs of the project (ALARA), including the following areas:

    a. Safety procedures

    b. Time – Distance - Shielding

    c. Emergency Procedures

    d. Specific duties and responsibilities assigned

    e. Tool requirements

    f. Familiarity /Documents /Drawings etc.

g. Practice

2. Did not plan, train, or provide necessary equipment to work on Beta Radiation.

3. Did not plan for adequate time to complete project.

4. Did not plan for adequate materials to be present to deal with a radiation leak

Training

5. Failed to document and train on all safety concerns associated with project before starting said project.

6. Failed to provide written materials to staff involved concerning their roles in project.

7. Failed to train concerning specific differences between various source types being operated.

8. Failed to review operation of radiation monitoring equipment with personal and develop written documentation as to best use. (i.e. sound turned off on inspector model etc.)

9. Failed to go over and train concerning emergency procedures.

While Working

10. Leak tests on gauges removed from crates were not documented.

11. Gauge in question was operated before results of source leak test were known.

12. Without direct assignment of overall responsibility for project, Project Manager had work continue without being present.

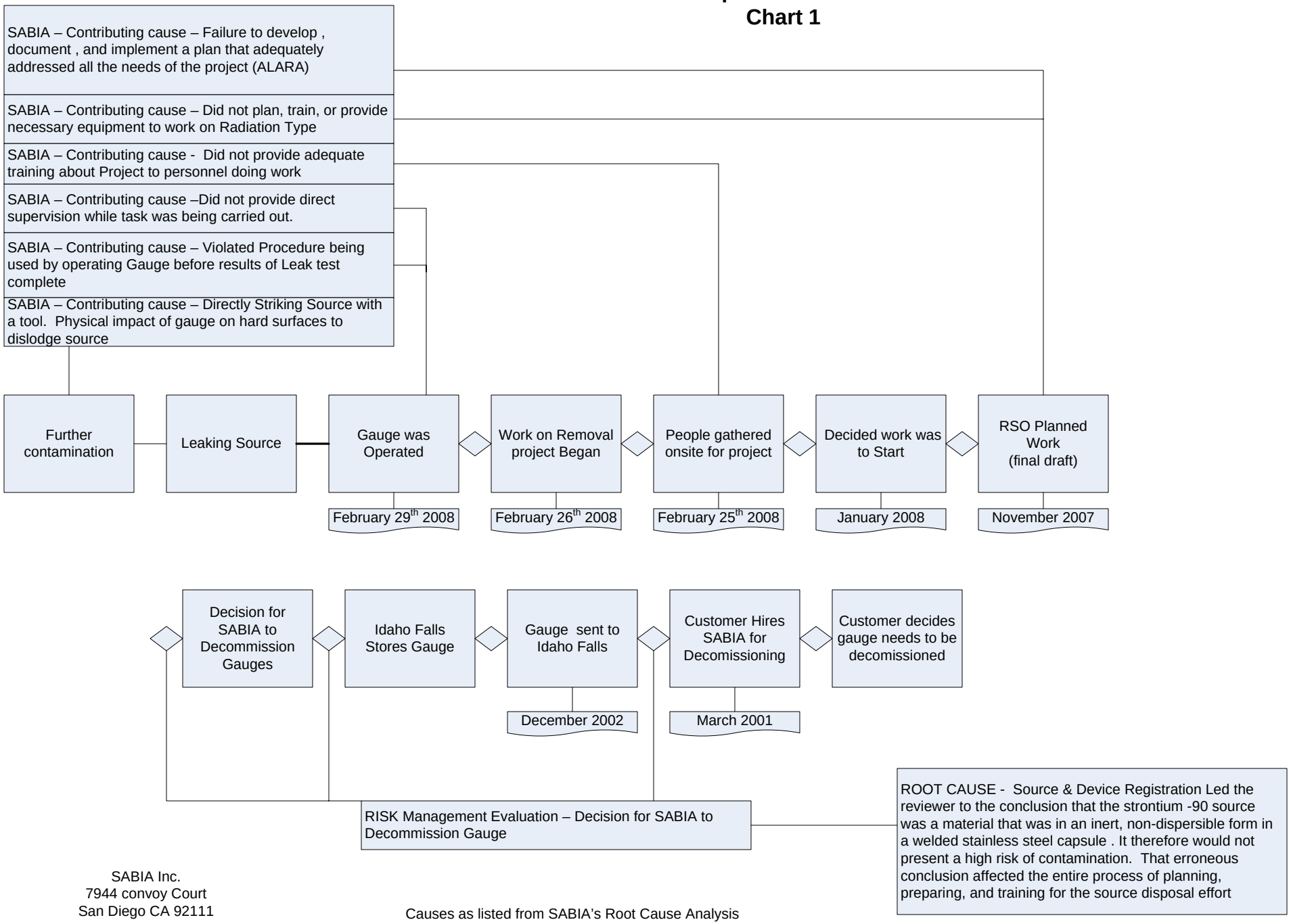
13. Ventilation was not turned off to minimize further spread of contamination once leak was discovered.

14. Priority was to complete work in an inadequate time frame.

Simplified Root Cause Analysis

Simplified Time line

Chart 1



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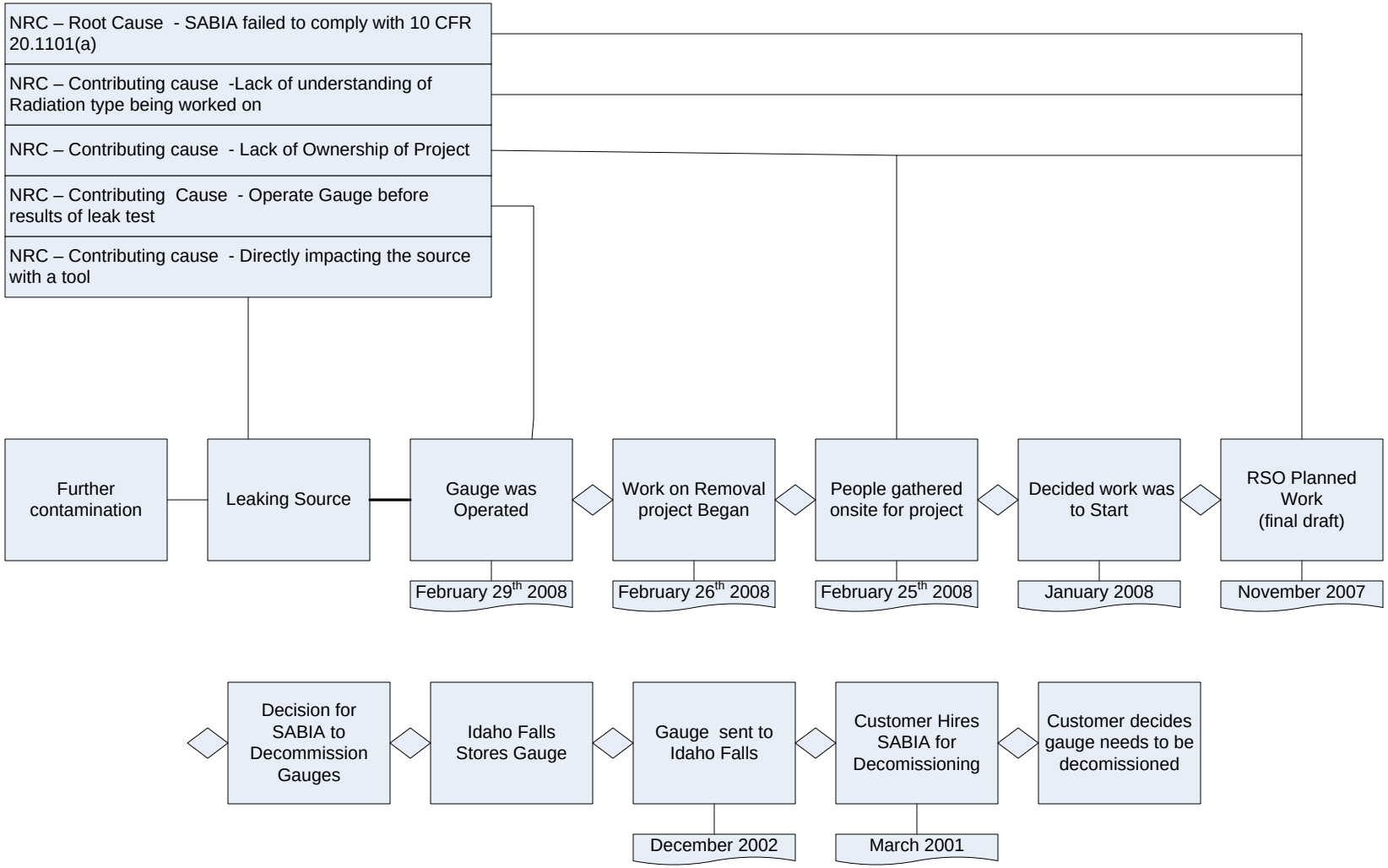
Causes as listed from SABIA's Root Cause Analysis

Simplified Root Cause Analysis

Simplified Time line

Chart 2



Causes as listed in the NRC Report 030-35997/08-001

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