Excerpts from the Nuclear Safety Standards Commission KTA 1503.1 with remarks on BVP "AT".

***italics*, red and bold by Baltus.**

3 Measuring objects and measuring procedures
3.1 General requirements

(6) In analysing radioactive substances, radioactive iodine, **tritium**, radioactive strontium, **carbon 14** and alpha emitter bonded to suspended particles, the rate of flow is to be measured. A deviation of the volume flow of the partial flow of ...

> *regarding 3.1 (6)* water, respectively air humidity there are suspended particles to which *tritium and C14 can be bonded.*

3.3.2 Analysing

(4) The suspended particle filter must be immediately measured if one of the above threshold values of monitoring the exhaust air is reached.

> *For the "AT" containers jointly developed together with customers a measurement through the 47 mm clear width of the container, through the easily dismantled, easily accessible and large dimensioned dust barriers is a measure which can be implemented very well.*

4 Sampling

(5) In dimensioning components of filters for suspended particles and iodine the following has to be taken into consideration:

a) During operation **gas tightness must be secured.** This is the case if the volume flows of infiltrated air at a differential pressure of about 100 mbar is not greater than 1 % of the partial volume flow sample.

> *The combination elements of the "AT" containers are simple and robust designed. Thanks to the just as robust, repeatedly usable seals, leaks can be ruled out (even if leaks can naturally theoretically occur). During the air-tightness tests the "AT" containers remain in the equipment. Furthermore, direction of action is not stipulated for the "AT" dust barrier! Also, before sealing the "AT" containers a **visual inspection** is certainly possible. The QM department will be grateful for it.*

Thanks to the modern construction design of the "AT" containers leaks through the robust and reusable seals and through a screwed connection and an additional closure with two clearly defined positions ("Closed" or "Open") are virtually impossible (even if leaks can theoretically occur).

b) **Damage to the filter in the area of the filter seal**
and a bypass flow around the filter must be avoided.

Like a); leaks on the connections are to be regarded as "damage to the filter ...". Thanks to the construction design, these leaks are ruled out on the "AT" containers – otherwise as before.

e) The components of the filter holder which have contact with the measuring medium must be easily decontaminated.

The molecular sieve container must certainly be regarded as a "filter holder", here then the molecular sieve is the filter. With regard to this the arguments for "AT" are exchanged, respectively shown in the list of arguments. Operating instructions for measuring and decontaminating "AT" containers are superfluous – thanks to the construction design, measurement and decontamination of "AT" containers can be very well implemented.

(7) The sampling system for continuous collection of radioactive substances bonded with suspended substances must be designed in such a way **that a spectrum of suspended substances with an aerodynamic equivalent diameter in the range of 0.1 to 20 µm reaches the suspended substances filter.**

*Filters should "... suspended substances (and air humidity) with an aerodynamic equivalent diameter in the range from 10 to 20 µm..." be held back. Since its introduction BVP "AT" has a very generously dimensioned dust barrier (> 18 cm^2) with a pore width of **20 µm** and was hence designed in conformity with the KTA during development.*

5 Design of the fixed-installation monitoring equipment
5.1 Arrangement and fitting
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(2) The measuring and sampling devices must be installed or fitted in such a way that
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b) testing, maintenance and repair is easily possible.

> *From "AT" the point "... easily possible..." is definitely complied with. Easy to open (nevertheless, only with a tool) through an opening of **47 mm** clear width easy and quick to empty, easy and quick to fill, and consequently a greatly reduced dust generation. Furthermore, **visual inspection** of the whole container can be quickly and simply carried out without special equipment. The only component which needs to be "maintained" very seldom is perhaps the oversized dust barrier. Here, too, the following also applies to both sides of the container: easy to replace, easy to measure, easy to clean or decontaminate, easy to refit.*

5.5 Inspectability
The monitoring equipment must be designed in such a way that **the perfect functioning of the individual devices**
within the framework of the first tests in accordance with section
6.2.2 **and** recurring tests in accordance with section
6.2.3 **can be determined.** Function tests must also be able to be performed during the power operation of the nuclear power station.

> *On this basis it can be clearly inferred that the containers that are at that time in collection operation must be tested. During the power operation of the nuclear power station all components used in the collection period must remain in the collector. During the tests the "AT" containers naturally remain in the C14/H3 collector!*

6.2.2.1 Proof of suitability
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(2) The proof of suitability consists of the (plant-independent)
proof of equipment properties and the **plant-related suitability test.**

> *The plant-related test was carried out in Grafenrheinfeld! No separate plant-independent test was carried out, the direct test in the nuclear plant can be evaluated as conservative measure – a direct test under real operating conditions.*

Furthermore, the "AT" container was tested in the evaluating laboratories with 0.8 bar under pressure; that can certainly also be performed with 1 bar under pressure – due to its design (tried-and-tested vacuum technology) "AT" thereby becomes increasingly better sealed! The practically-oriented plant test with 1.5 bar ***over pressure*** *is performed during production.*

The technician on site knows: an effective seal during under pressure does not automatically mean an effective seal during over pressure!

(3) The equipment properties are proved either **through operational trial**, through extended test verification,
through an expanded initial start-up ...

Also, for this point the proof of equipment properties is performed in conformance with KTA through operational trial (Asse Remlingen, Grafenrheinfeld nuclear power plant) and the extended initial start-up with experts in Grafenrheinfeld nuclear power plant.

(4) The test must be performed by experts.

This took place in Grafenrheinfeld nuclear power plant.

6.4 Inspection verifications
All performed test must be proven by inspection verifications. The inspection verifications must be stored. These must contain the following information:
a) Test object,
b) Type of test,
c) Test documents,
d) Test results,

As "test object" and for determining a "test result" for the recurring inspections, the "AT" containers which at that time are in operation remain in the C14/H3 collector during the tests of effective seals in keeping with the requirement for practice-oriented tests.