

Confirmation Test of Dust Inhibitor

We have conducted trial spraying of dust inhibitor since April 1, 2011 in order to prevent scattering of radioactive materials, and conducted confirmation test on effectiveness of dispersion and influence of the dust inhibitor.

[Test items]

1. Confirmation test of sprinkling spot
2. Confirmation test of hardened state
3. Confirmation test of exposure dose before and after spraying
4. Influence confirmation test of electric facilities
5. Evaluation on heat-transfer performance of fuel rods with water contamination by dust inhibitor and physical property change of dust inhibitor by radiation
6. Adherence to the outer wall of the Reactor Building and steel frames
7. Spraying by an unmanned crawler dump truck

[Test results]

	Items	Results
1	Confirmation test of sprinkling spot	Good
2	Confirmation test of hardened state	Good
3	Confirmation test of exposure dose before and after spraying	Good
4	Influence confirmation test of electric facilities	Good
5	Evaluation on heat-transfer performance of fuel rods with water contamination by dust inhibitor and physical property change of dust inhibitor by radiation	Good
6	Adherence to the outer wall of the Reactor Building and steel frames	Good
7	Spraying by an unmanned crawler dump truck	Good

END

< Appendix > The Result of Confirmation Test of Dust Inhibitor

The Result of Confirmation Test of Dust Inhibitor

1. Confirmation test of sprinkling spot

[Confirmation items]

It is confirmed that it is sprayed evenly by viewing after spraying and hardening the dust inhibitor.

[Result]

Regarding the spraying points on April 1, it was confirmed that it was sprayed evenly by viewing after spraying and hardening the dust inhibitor. The confirmation results of sprinkling spot after spraying and hardening the dust inhibitor are showed Picture No.1



The situation of the examination
dispersion (on April 1)



Picture No.1: Confirmation test of sprinkling spot (the point of spraying on April 1)

2 . Confirmation test of hardened state

[Confirmation items]

It is confirmed that it is hardened the surface of the spraying point after spraying the dust inhibitor.

[Result]

Regarding the spraying points on April 1, we prospected there on April 3(after spraying; 2 days later), on April 7(after spraying; 6 days later), and on April 13(after spraying; 12 days later), it was confirmed that it was hardened the surface of the spraying points by viewing.

The confirmation results of hardened state are showed Picture No.2



The hardened state on April 3



The hardened state on April 7



The hardened state on April 13

Picture No.2: Confirmation test of hardened state (the point of spraying on April 1)

3 . Confirmation test of exposure dose before and after spraying

[Confirmation items]

It is confirmed the change of exposure dose data before and after spraying the dust inhibitor.

[Result]

Regarding the spraying points on April 1,5 and 12, it was confirmed no change of exposure dose data before and after spraying the dust inhibitor by survey monitor with Ionization chamber type.

The results of confirmation test of exposure Dose are showed List No.1, and the situation of measuring exposure dose is showed Picture No.3

List No.1 Confirmation test results of dose data before and after spraying

Spraying Date	Dose data before spraying	Dose data after spraying
April 1	1.0mSv/h (April 1)	0.8mSv/h (April 3)
April 5	1.6mSv/h (April 5)	1.5mSv/h (April 6)
April 12	1.6mSv/h (April 12)	1.5mSv/h (April 13)



Picture No.3:The situation of measuring exposure dose

4 . Influence confirmation test of electric facilities

[Confirmation items]

Due to evaluate the influence on electric facilities by the scattering inhibitor, It is confirmed the state of operating, appearance and insulation, while spraying the dust inhibitor that it is operating the test facilities (on working of distribution panel, pump, motor, cable).

[Result]

- Operating conditions of Pump : good
- Operating conditions of Distribution Panel : good
- Insulation resistance test : good(over standard value[0.2MΩ])
- Surface of cables: good



Spraying the dust inhibitor



Insulation resistance test

Picture No.4:The situation of the influence confirmation test of electric facilities

5. Evaluation on heat-transfer performance of fuel rods with water contamination by dust inhibitor and physical property change of dust inhibitor by radiation

[Confirmation items]

In order to check the impact of dust inhibitor mixed in the Spent Fuel Pool on fuel, we conducted below tests:

- Physical property (density, viscosity) of dust inhibitor, the status of adherence to fuel cladding and solidification
- Impact on the heat-transfer performance of fuel rods and fluidity of cooling water
- Physical property change (density, viscosity) of dust inhibitor by radiation

[Result]

From the overall evaluation of above test results, we confirmed that the dust inhibitor we are planning to spray to the Reactor Building will not exacerbate the cooling function by making heat-transfer performance of fuel cladding worse or plugging the route for cooling water.

6. Adherence to the outer wall of the Reactor Building and steel frames

[Confirmation items]

To confirm that the dust inhibitor adheres to the concrete wall (elastic spray coating) and steel frames, the actual subject for spraying.

[Result]

We sprayed to the test materials on April 7. 24 hours after spraying, we checked the formation of coating by the dust inhibitor on each surface by visual inspection. We also tested the adhesive strength as a reference. From visual inspection and adhesive strength, we confirmed that the adherence of the dust inhibitor to the outer wall and steel frames (vertical and horizontal) was acceptable. Figures 5 and 6 are the spraying to the test materials and adhesive strength tests.



Figure 5: Spraying to the test materials and adhesive strength tests (steel plate surface)



Figure 6: Spraying to the test materials and adhesive strength tests (outer wall (paint finish))

7. Spraying by an unmanned crawler dump truck

[Confirmation items]

We operated the unmanned crawler dump truck to check the each equipment, spraying capacity and spraying work velocity by remote control. Figures 7 and 8 are the allocation of equipments and status during tests.



Figure 7: allocation of vehicles during test



Figure 8: spraying test

[Result]

(Operability and safety)

Operability during remote control and stability in transit: good

Stop operation when the radio control is off: good

Conditions under which the remote control can be done (the impact by distance and shields): good

(Accuracy of spraying and spraying work velocity)

The range for spraying, spraying work velocity and tangential velocity: good

Confirmation of spraying status by cameras (cameras were located at the operation truck and the camera vehicle): good

From results above, we confirmed that the remote operability and the spraying capacity were acceptable.

END