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May 2, 1986

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC. 20555

Subject: Byron Station Units 1 and 2
Braidwood Station Units 1 and 2
Amendment 7 to Fire Protection Report
NRC Docket Nos. 50-454/455 and 50-456/457

- References (a): August 16, 1982 letter from T.R. Tramm to H.R. Denton
- (b): February 3, 1984 letter from R.C. Knop to C. Reed
- (c): April 27, 1984 letter from R.F. Warnick to C. Reed
- (d): July 6, 1984 letter from D.L. Farrar to H. R. Denton
- (e): March 25, 1985 letter from R.F. Warnick to C. Reed
- (f): March 1, 1985 letter from T.R. Tramm to H.R. Denton

This letter provides Amendment 7 to the Byron/Braidwood Fire Protection Report (FPR) which was submitted in Reference (a). This amendment updates the FPR to incorporate new information and analyses applicable to Byron Unit 1 and 2 and Braidwood Units 1 and 2. These changes do not represent a decrease in the level of fire protection program which require prior NRC approval according to Condition 6 of the Byron 1 Operating License, NPF-37.

Amendment 7 includes a new section 2.4, chapter 3, and Appendix A5.8 providing the Braidwood Unit 1 safe shutdown analysis, the Braidwood Station BTP CMEB 9.5-1 conformance description, and Appendix R (Section III G.2) deviations for Braidwood Unit 1, respectively. This is new information which will allow the staff to begin its Braidwood Station fire protection reviews. Note that an NFPA code review of the Braidwood Station is currently in progress.

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This review will be completed on time to document the results (i.e. all NFPA code deviations) in Chapter 3 of the FPR prior to fuel load of Braidwood Unit 1. While a substantial portion of this review is already complete, a decision was made not to submit these results in an FPR amendment until the entire review is complete. In the interim, the completed portions of the review and the status of the ongoing review is available for audit.

Amendment 7 also includes miscellaneous changes throughout the document. These changes can generally be categorized as either editorial in nature, or as changes to reflect the latest "as-built" condition of the plants. Attachment A to this letter provides an itemized summary and explanation of all changes included in this amendment. This attachment is provided as an aid to the NRC Staff in identification of changes.

In some cases, the changes which reflect the "as-built" condition of the plant result in an increase in the combustible inventories for some zones, with resultant increased combustible loadings. In these cases, an analysis of the increased combustible loadings was performed to demonstrate that the level of fire protection was not decreased. This evaluation is provided in Attachment B to this letter.

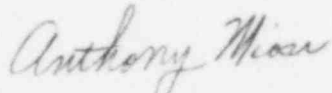
One particular change deserves special mention. During inspections of the Braidwood station documented in reference (b) and (c), Region III questioned the use of wire mesh fences to separate the 125Vdc safety related batteries from their associated switchgear. After much discussion with the NRC Staff, the applicant committed to replace the wire mesh fence with reinforced masonry walls. This was documented in reference (d). Reference (d) also included a commitment to update the FSAR and FPR to reflect this design change. This item was closed by the NRC in inspection report 50-456/85-004 and 50-457/85-004 which was provided in reference (e). Amendment 6 to the FPR, provided in reference (f), included a revision to the applicable parts of section 2.3 to describe the replacement of the wire mesh fence with the reinforced masonry wall. However, section 2.3 was also erroneously changed to indicate that the battery room ceilings were upgraded to 3-hour rated fire barriers. A review of the referenced documents clearly indicates that this was never intended, and design changes to accomplish this were not issued. Amendment 7 includes revisions to section 2.3 to delete the statements regarding the fire rating of the battery room ceilings. Inasmuch as the statements were included in the FPR by error, their deletion does not represent a decrease in the level of fire protection.

In summary, none of the changes to the Fire Protection Report included in Amendment 7 require NRC approval at this time. They represent either new information provided for NRC review or updates to reflect the "as-built" condition and editorial corrections, i.e. changes which do not represent a decrease in the level of fire protection.

One signed original and forty copies of this letter, the attachment and Amendment 7 are being provided for NRC review.

Please direct any questions that your or your staff may have to this office.

Very truly yours,



A. D. Miosi
Nuclear Licensing Administrator

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ATTACHMENT A

SUMMARY OF CHANGES CONTAINED IN B/B FPR AMENDMENT 7

<u>PAGE NO(s)</u>	<u>DESCRIPTION</u>
i and ix	Editorial corrections.
2.1-4 and 2.1-4a	Subsection 2.1.3.1 revised to explain that fire hazards analysis was based on Byron plant orientation and that Braidwood layout is 180° out of phase from Byron.
2.1-5 and 2.1-6	Part "a" items 10, 11, 12, 13, 14, and 15 added to reflect current design information. Part "a" item 2 changed to delete exception regarding heater bay area. Part "a" items 4 and 8 have editorial changes. Part "b" item 5 revised to indicate that charcoal filter deluge systems are manual. Part "b" item 4 has editorial change. Subsection 2.1.3.2.3 has editorial change.
2.1-6a	Revised to reflect current design information on locations of Halon bottles.
2.1-11	Statement concerning use of fire retardant paint on protection racks deleted, since this type of paint was not used in this application.
2.1-12	Item f revised to include specific heat load of lube oil conditioner.
2.1-13 and 2.1-13a	Subsection 2.1.4.6 item b revised to indicate that locations of portable extinguishers are indicated symbolically in the figures in Section 2.3. Figures are not meant to show actual numbers and locations.
2.2-4	Revised to add reference to essential cable pans for fire zone 3.2-0.
2.2-12	Revised to indicate that there are essential cable pans in fire zone 12.1-0.
2.2-15	Revised to reflect addition of 50,000 gallon outdoor fuel oil storage tank to fire zone 18.20-0 at both Byron and Braidwood.

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<u>PAGE NO(s)</u>	<u>DESCRIPTION</u>
2.2-17	Addition of reference to Note 1 for zones 1.2-1, 1.2-2, 1.3-1, and 1.3-2. Also revised to indicate that temperature switches are in charcoal banks 1A and 1B in zone 1.3-1 and banks 2A and 2B in zone 1.3-2. Other changes are editorial.
2.2-21	Revised to indicate that Braidwood zones 7.1-1 and 7.1-2 have ionization detection, and zone 8.1-0 has ionization detection at Byron only. Also, 1110 gallons of lube oil conditioner has been added for zones 8.3-1 and 8.3-2. The fire loading for these two zones has been revised (see Attachment B).
2.2-22	Revised to indicate that ultraviolet detection in zones 8.5-1, 8.5-2, and 8.6-0 is at Byron only. Also, for zone 8.6-0, table has been revised to discuss manual charcoal deluge system. 1800 lbs of charcoal have been added to the combustibles for this zone and the fire loading has been revised. Other changes are editorial.
2.2-23	Revised to show that Braidwood zones 10.1-1, 10.1-2, 10.2-1, and 10.2-2 have only Fenwal thermal detection. Other changes are editorial.
2.2-24	Revised to show that zone 11.3-0 has automatic sprinkler for stairway and open hatch.
2.2-25	Revised to show that 11.4-0 has automatic sprinkler for stairway and open hatch.
2.2-26	Revised to show that Braidwood zones 11.4A-1 and 11.4A-2 have only Fenwal thermal detection, and that zone 11.5-0 has automatic sprinkler for stairway, open hatch, and auxiliary building waste oil drain tank. Other changes are editorial.
2.2-27	Revised to show that Braidwood zone 11.5A-0 has ionization detection, and that zone 11.6-0 has automatic sprinkler for stairway and open hatch.

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<u>PAGE NO (s)</u>	<u>DESCRIPTION</u>
2.2-27a	Revised to show that Braidwood zone 11.6C-0 has ionization detection. Also added reference to Unit 1 suppression zone 10 for fire zone 11.7-0.
2.2-28	Revised to discuss manual charcoal deluge system for zone 14.6-0. 700 lbs of charcoal have been added to combustibles for this zone and fire loading has been revised. References to Note 1 and suppression zone 58 have also been added for zone 14.6-0. Other changes are editorial.
2.2-29	Revised to indicate that zones 18.1-1, 18.1-2, 18.2-1, and 18.2-2 do not have a charcoal deluge system. There are no charcoal banks in these zones. Also, for these zones changes have been made to show that supply air ducts have ionization detection and there are no charcoal thermostats.
2.2-30	Revised to show that there is automatic sprinkler system for store room in zone 18.7-0. Other change is editorial.
2.2-31	Reduced combustibles for zones 18.10A-1, 18.10A-2, 18.10B-1, and 18.10B-2: 92,700 gallons of transformer oil reduced to 12,500 gallons (former quantity erroneously referred to pounds of transformer oil). Fire loadings are also reduced. Also for fire zone 18.11-0, Braidwood has both ionization and ultraviolet detection.
2.2-32	Revised to indicate that both Byron and Braidwood have ionization and ultraviolet detection in zone 18.12-0. Also, only Byron has ionization detection in zone 18.13-0. Table was also revised to indicate that ESW cooling towers are at Byron only.
2.2-33	For zone 18.20-0 revisions were made to include the new 50,000 gallon fuel oil storage tank and to indicate that zone has Fenwal rate compensating detection. The quantity of combustibles and fire loading were also changed. For zone 18.26-0, a discussion of the manual charcoal deluge system was added. 600 lbs of charcoal were added to the combustibles, and the fire loading has increased.

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<u>PAGE NO(s)</u>	<u>DESCRIPTION</u>
2.2-33a	Revised to show that zone 18.36-0 has ionization detection. Other changes are editorial.
2.3-1	Deleted sentence which stated that containment base slab, walls, and roof slab are 3-hour fire rated. These were down-rated in FPR Amendment 6. Down-rating is consistent with figures in Section 2.3.
2.3-11	Revised to state that ionization duct detectors are located in exhaust ductwork for control room panels.
2.3-13	Statement regarding portable extinguishers revised to be consistent with change on page 2.1-13.
2.3-17	Clarification of fire damper arrangement and extinguishing and detecting capabilities in zone 3.1-1.
2.3-19	Statement on safety-related equipment in zone 3.2-0 reworded for clarification.
2.3-33a and 2.3-34	Fire barrier description reworded for clarification.
2.3-39	Statement regarding portable fire extinguishers revised to be consistent with change on page 2.1-13.
2.3-44, 2.3-45, and 2.3-45a	Fire barrier description reworded for clarification and to describe differences between Byron and Braidwood.
2.3-46, 2.3-48, and 2.3-55	Statements regarding portable fire extinguishers revised to be consistent with change on page 2.1-13.
2.3-58	Fire barrier description for zone 5.4-1 (and 5.4-2) revised to indicate that the ceiling of the battery enclosure carries no fire rating. This is acceptable since the battery enclosure ceiling is not part of the barrier separating the zone from adjacent zones.

ATTACHMENT A (Cont'd)

<u>PAGE NO(s)</u>	<u>DESCRIPTION</u>
2.3-60, 2.3-60a, and 2.3-63	Fire barrier description revised to describe differences between Byron and Braidwood for zones 5.5-1 and 5.5-2.
2.3-63a	Fire barrier description for zone 5.6-1 (and 5.6-2) revised to indicate that the ceiling of the battery enclosure carries no fire rating. This is acceptable since the battery enclosure ceiling is not part of the barrier separating the zone from adjacent zones.
2.3-68	Revised to indicate that Braidwood zone 7.1-1 (and 7.1-2) has ionization detection.
2.3-71	Revised to indicate that zone 8.1-0 has ionization detection at Byron only.
2.3-72	Statement regarding portable fire extinguishers revised to be consistent with change on page 2.1-13.
2.3-73	Fire barrier description for zone 8.3-1 changed to give revised reinforced concrete floor thickness (values increased).
2.3-74 and 2.3-75a	Combustibles and fire loading revised for zones 8.3-1 and 8.3-2 to include 1110 gallons of lube oil conditioner in each zone.
2.3-76	Fire barrier description revised to indicate that there are 3 floor drains (not 2) in zone 8.4-1.
2.3-77, 2.3-78, and 2.3-78a	Discussion of manual fire suppression equipment for zone 8.4-1 revised to be consistent with change on page 2.1-13. Also, revised description of fire barrier for zone 8.5-1. Fire barrier rating is not changed.
2.3-79 and 2.3-79a	Extinguishing and detecting capabilities for zone 8.5-1 revised to indicate that only Byron has ultraviolet detectors over the mezzanine floor. Also discussion for zone 8.5-2 revised to clarify differences between zone 8.5-1 and 8.5-2.

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<u>PAGE NO(s)</u>	<u>DESCRIPTION</u>
2.3-80 and 2.3-81	Discussion for zone 8.6-0 revised to include manual deluge system for off-gas filter unit and to add 1800 lbs of charcoal to the combustibles. The fire loading has been revised. Also, a revision has been made to indicate that only Byron has ultraviolet detection in this zone.
2.3-86	Editorial correction.
2.3-93	Discussion for zone 10.1-1 revised to indicate that Byron has ionization detectors and Braidwood has Fenwal heat detectors.
2.3-95, 2.3-109a, 2.3-112, 2.3-116, 2.3-117, and 2.3-127	Minor revisions made to fire barrier descriptions for zones 10.1-2, 11.3-0, 11.3-1, 11.3B-1, 11.3C-1, and 11.4A-1. Fire barrier ratings have not changed.
2.3-128a	Revised to indicate that zone 11.4A-1 has ionization detection at Byron only. (Both Byron and Braidwood have Fenwal thermal detection.)
2.3-129a	Statement regarding portable extinguishers revised to be consistent with change on page 2.1-13.
2.3-133	Minor revision to fire barrier description for zone 11.4C-1. Fire barrier rating has not changed.
2.3-139a	Revised to indicate that zone 11.5A-0 has ionization detection at Braidwood only.
2.3-141b and 2.3-147	Minor revisions to fire barrier descriptions for zones 11.6-0 and 11.6A-1. Fire barrier ratings have not changed.
2.3-147a	Statement regarding portable fire extinguishers in zone 11.6A-1 revised to be consistent with change on page 2.1-13.
2.3-147d	Discussion for zone 11.6C-0 revised to indicate that Braidwood has ionization detection.

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<u>PAGE NO (s)</u>	<u>DESCRIPTION</u>
2.3-148	Revised to indicate that zone 11.7-0 has ionization detection except on elevation 475 feet 0 inch.
2.3-150	Revised to indicate that 11.7-1 has ionization detection except on elevation 467 feet 0 inch.
2.3-152	Minor revision of fire barrier description for zone 12.1-0. Fire barrier rating has not changed.
2.3-153	Editorial correction.
2.3-154	Fire barrier description for zone 12.1-0 revised to indicate that fire dampers are provided in wall separating this zone from the auxiliary building. Also, deleted statements under protection criteria and measures which indicated that there are no safety-related cable trays in this zone.
2.3-155	Revised to indicate that zone 12.1-0 has 4 manual hose stations on Elevation 426 feet 0 inch (previously stated that there were 2). Also, statement regarding portable extinguishers revised to be consistent with change on page 2.1-13.
2.3-158	Discussion for zone 13.0 revised to indicate that Halon system can be manually initiated by a toggle switch rather than a pushbutton.
2.3-159	Revised to indicate that zone 14.1-0 has seven floor drains at Byron and six at Braidwood.
2.3-167	Discussion for zone 14.6-0 revised to include manual deluge system for the charcoal filter units. Combustibles revised to add 700 lbs of charcoal. Also fire loading was revised.
2.3-178, 2.3-178a, 2.3-179, 2.3-180, 2.3-180a, and 2.3-181	Fire barrier descriptions for zones 18.4-1, 18.4-2, 18.5-1, and 18.5-2 revised to indicate differences between Byron and Braidwood. Barrier ratings have not changed.
2.3-184	Statement regarding portable fire extinguishers for zone 18.6-0 revised to be consistent with change on page 2.1-13.

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<u>PAGE NO (s)</u>	<u>DESCRIPTION</u>
2.3-185	Revised to indicate that storeroom in zone 18.7-0 is protected by automatic sprinklers.
2.3-186	Minor revision to fire barrier description for zone 18.8-0. Barrier rating has not changed.
2.3-189 and 2.3-190	Revised to indicate that main power transformers in zones 18.10A-1, 18.10A-2, 18.10B-1, and 18.10B-2 contain only 12,500 (not 92,700) gallons of transformer oil. Fire loadings are also reduced.
2.3-194 and 2.3-197	Revised to indicate that zones 18.11-0 and 18.12-0 have ultraviolet detectors at Braidwood in addition to ionization detectors.
2.3-198	Revised to indicate that zone 18.13-0 has ionization detectors at Byron only.
2.3-202	Revised to indicate that zone 18.15-0 has twelve (not 1) manual hose station.
2.3-205	Revised to include discussion of new 50,000 gallon fuel oil storage tank in zone 18.20-0. Also revised to indicate that foam system activated by a Fenwal rate compensating detector.
2.3-211 and 2.3-211a	Revised to include discussion of manual deluge system for TSC HVAC charcoal filter unit. Also added 600 lbs. charcoal to combustibles and revised fire loading.
2.3-219	Minor revision to fire barrier description for zone 18.35-0. Barrier rating has not changed.
2.3-220	Editorial correction.
2.3-221	Revised to indicate that ionization detection is provided in zone 18.36-0.
2.4-1 (Byron)	Editorial correction.
2.4-49 (Byron)	Corrected to indicate that Unit 1 RWST is located in zone 16.1-1.
2.4-1 through 2.4-215 (Braidwood)	Provided new Braidwood-1 Section 2.4 which includes Braidwood-1 safe shutdown and high-low pressure interface analysis.

ATTACHMENT A (Cont'd)

<u>PAGE NO(s)</u>	<u>DESCRIPTION</u>
3.1-1, 3.1-2, 3.1-3, 3.1-4, 3.1-5, 3.1-6, 3.1-7, 3.1-8, 3.1-9, 3.1-11, 3.1-12, and 3.1-13 (Byron)	Editorial corrections, corrected position titles, and miscellaneous changes to description of fire protection program responsibilities at Byron.
3.2-2 (Byron)	Editorial: "cords" changed to "permit cards".
3.3-6 (Byron)	Editorial change.
3.4-1, 3.4-2, and 3.4-3 (Byron)	Editorial corrections and also revised discussion of responsibilities for fire protection QA inspections and reference material used in audits.
3.5-1, 3.5-3, 3.5-4 (Byron)	Editorial corrections.
3.5-5 (Byron)	Editorial correction and revised discussion to state that door in turbine wall adjacent to Unit 1 unit auxiliary transformer has 1 1/2-hour or Class B rating.
3.5-9, 3.5-11, 3.5-12, 3.5-13, 3.5-14, and 3.5-15 (Byron)	Miscellaneous editorial corrections and clarifications. On page 3.5-9, for items (2) and (4), the statement "comply" was deleted, leaving reference to Table 3-1 for delineation of compliance to NFPA code.
3.6-1, 3.6-2, 3.6-3, 3.6-4, 3.6-5, 3.6-6, 3.6-7, and 3.6-8 (Byron)	Miscellaneous editorial corrections and clarifications. Exception has been taken to items (2) and (4) on page 3.6-2. For items a.6 and b.1 on page 3.6-1, item (7) on page 3.6-3, items (6) and (7) on page 3.6-6, and item f on page 3.6-8, the statement "Comply" has been deleted, leaving reference to Table 3-1 for delineation of conformance to NFPA code.

ATTACHMENT A (Cont'd)

<u>PAGE NO (s)</u>	<u>DESCRIPTION</u>
3.7-1 through 3.7-11 (Byron)	Miscellaneous editorial corrections and clarifications. Some changes made to be consistent with text in other parts of FPR. On page 3.7-4 discussion of compliance with requirement for isolating the control room HVAC system expanded to state that outside air intakes can be isolated on ionization detection, however HVAC system remains in operation.
3.8-1 (Byron)	Corrected procedure number.
3.1-1 through 3.8-1 (Braidwood)	Provided new Braidwood Sections 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, and 3.8 discussing compliance to BTP CMEB 9.5-1 for Braidwood.
3-1, 3-2, and 3-3 (Byron)	Revised introduction to Byron NFPA code review.
3-1 and 3-2 (Braidwood)	Provided new introduction for Braidwood NFPA code review.
A5.1-2, A5.1-3, A5.1-5 through A5.1-14	Deleted resume for T. Gray and added resumes for R. Adcock, J. Biggins, S. Chingo, N. Malicki, J. Robinson and R. Smith
A5.4-2	Deleted sentence stating that the ties to each hydrant from the yard main are controlled by post indicator valves. Also, revised sentence in second to last paragraph to state that there are five connections between the yard main and the interior loops.
A5.4-3	Revised discussion on control room annunciators for motor- and diesel-driven fire pumps.
A5.4-6	Revised to include discussion of automatic foam system for the new 50,000 gallon outdoor fuel oil storage tank.
A5.4-10 and A5.4-11	Minor revisions to description of CO ₂ system and editorial corrections.

ATTACHMENT A (Cont'd)

PAGE NO (s)

DESCRIPTION

A5.4-14

Revised to indicate that the electrical cable tunnels have two Class B fire detection circuits.

A5.4-15 through
A5.4-22 and A5.4-26
through A5.4-32

These tables have been revised primarily to be consistent with other parts of FPR text. Other changes were made to be consistent with current design information. For Tables A5.4-6 and A5.4-7, separate Byron and Braidwood pages have been generated since certain data (e.g. quantity of detectors and actual Halon concentration) for Braidwood may be different from Byron. Editorial corrections have also been made.

A5.8.3-1, A5.8.4-1,
A5.8.5-1, A5.8.6-1,
A5.8.7-1, A5.8.10-1,
A5.8.11-1, A5.8.12-1,
A5.8.13-1, A5.8.15-1,
A5.8.18-1 and
A5.8.32-1 (Byron)

Changes made to Byron-1 Appendix R deviations to indicate completion of certain commitments (e.g. installation of sprinkler systems). Also, editorial corrections were made.

Appendix A5.8
(Braidwood)

Added new section providing Braidwood-1 Appendix R deviations.

ATTACHMENT B

EVALUATION OF CHANGES TO COMBUSTIBLE INVENTORIES

<u>FIRE ZONE</u>	<u>OLD FIRE LOADING</u>	<u>NEW FIRE LOADING</u>	<u>EVALUATION</u>
8.3-1 8.3-2	62,200 58,000	66,400 61,700	The increase in the fire loading is due to the addition of 1100 gallons of lube oil conditioner in each of these zones. The increase is not significant and does not decrease the level of fire protection.
8.6-0	4,200	4,500	The increase in the fire loading is due to the inclusion of 1800 lbs. of charcoal for the off-gas filter units. The increase is not significant and does not decrease the level of fire protection. A manual deluge system is provided for these filter banks.
14.6-0	21,900	22,800	The increase in fire loading is due to the inclusion of 700 lbs of charcoal for the charcoal filter units. The increase is not significant and does not decrease the level of fire protection. A manual deluge system is provided for these filter banks.
18.10A-1 18.10A-2 18.10B-1 18.10B-2	8,670,000 8,670,000 8,670,000 8,670,000	1,170,000 1,170,000 1,170,000 1,170,000	The fire loading has been reduced due to correction of error in previous amendment. There are 12,500 gallons of transformer oil in each zone (not 92,700 gallons). Quantity of transformer oil given previously corresponded to "pounds" rather than "gallons".
18.20-0	14,800,000	2,640,000	The fire loading has been reduced. Although 50,000 gallons of diesel fuel was added to the combustibles, the berm area increased.

ATTACHMENT B (Cont'd)

<u>FIRE ZONE</u>	<u>OLD FIRE LOADING</u>	<u>NEW FIRE LOADING</u>	<u>EVALUATION</u>
18.26-0	12,200	14,000	The increase in the fire loading is due to the inclusion of 600 lbs charcoal for the charcoal filter units. The increase is not significant and does not decrease the level of fire protection. A manual deluge system is provided for these filter banks.