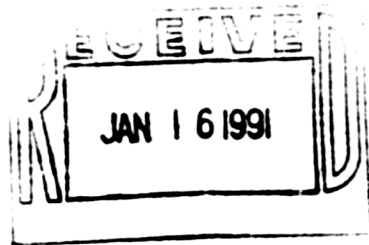


Hilti, Inc.
Technical Center
12211 E. 51st St.
P.O. Box 21148
Tulsa, Oklahoma 74121

Phone (918) 252-6343
Telex 216 535
Fax 918-252-6347

HILTI®

PDR



11 January 1991

United States Nuclear Regulatory Commission
Attn.: Robert D. Martin
Region 4
611 Ryan Plaza Drive
Arlington, TX 76011

Subject: 1" Hilti Expansion Anchor

Dear Mr. Martin,

Please reference my earlier letter to you dated December 14, 1990, regarding the 1" expansion anchor variance from published ultimate tensile loads.

Enclosed please find a sample of a letter which is being sent out. Also, attached is a list of the licensees to whom the letter is being sent. We will continue to keep you updated. If you have any comments or questions, please feel free to call.

Sincerely,

A handwritten signature in cursive script that reads "Richard E. Wollmershauser".

Richard E. Wollmershauser, P.E.
Director, Technical Services

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Enclosures

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PDR *ANAK 0600003*
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A member of Hilti International

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Hilti, Inc.
5400 South 122nd East Avenue
P.O. Box 21148
Tulsa, OK 74121
(918) 252-6000
Telex 203668



URGENT

January 8, 1991

Head Design Engineer
Nuclear Power Plant
Anytown, USA

Re: HILTI KWIKBOLT II CARBON STEEL EXPANSION ANCHORS

Dear Mr. Doe:

The Hilti Kwik Bolt II expansion anchor was introduced on December 1, 1988, after an extensive 2 year development and quality testing program. The anchor was subsequently site tested at no fewer than 13 geographically scattered sites throughout the United States with no indications of any problems.

During testing recently conducted in Michigan and Pennsylvania, Hilti observed indications of lower ultimate tensile load values for the 1" carbon steel anchor. Subsequent testing in concrete from a Pennsylvania roadway has confirmed that the 1" anchor may not always exhibit follow-up expansion, providing in these instances safety factors as low as 1.2-1.4. The Nuclear Regulatory Commission has been informed of these results and of our attempt to identify the cause and scope.

Further testing in the roadway concrete has shown the 3/4 x 12 anchor may display a similar phenomenon, providing safety factors as low as 1.6. Testing conducted on all other 3/4" and smaller diameter carbon steel anchors and all sizes of stainless steel anchors has shown no change from expected values. The distinction may arise from the method of manufacture, i.e., the 1" and 3/4 x 12 anchors are machined as opposed to cold-formed. No deviations are involved, and all anchors tested have met design specifications.

The anchors continue to function properly in general concrete historically used for testing. Therefore, to isolate installations affected, the identity of the specific concrete constituents which may trigger the anomaly is being pursued. The unique features relative to the Michigan concrete appear to be the use of dolomitic aggregate with crushed dolomitic fines. Two samples of the Pennsylvania concrete were analyzed: one has

Hilti KBII
January 8, 1991
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limestone aggregate with carbonaceous inclusions; the other has carbonaceous dolomitic limestone aggregate. All concretes displaying the phenomenon had been exposed to the exterior environment for significant periods of time.

Out testing indicates that anchors which do not slip at proof loads of 2.5 times the working load will not exhibit the phenomenon. Site testing assistance is available to aid in evaluating anchor compatibility at your facility. We are continuing to intensively investigate. As additional investigative results are generated they will be distributed. In the meantime, if you have any questions please call Jerry Burrow, Manager, Field Engineering, in Tulsa, at 1-800-727-3427.

Sincerely,



Richard E. Wollmershauser, P.E.
Director, Technical Services

NUCLEAR PLANT LETTERS

W.B. Smith
HD Design Engineer
Catawba Nuclear Power Plant
P.O. Box 33189
Charlotte, NC 28242

H. Lee Williams
Lead Civil Engineer
CP & L
Harris Nuclear Power Plant
P.O. Box 1551
Raleigh, NC 27602

J. W. Keirnan
Design Engineer
Duke Utility Co.
McGuire Nuclear Power Plant
P.O. Box 33189
Charlotte, NC 28242

Terry Bradley
Lead Structural Engineer
Duke Utility Co.
Oconee Nuclear Power Plant
P.O. Box 33189
Charlotte, NC 28242

Bob Whorton
Lead Structural Engineer
SCEG
Summer Nuclear Power Plant
P.O. Box 88
Henkinsville, SC 29065

Don Warembourg, P.E.
Public Service Company of Colorado
Fort St. Vrain Nuclear Power Plant
2460 West 26th
Denver, CO 80211

Zarif Botross, P.E.
Wolf Creek Nuclear Power Plant
Highway 75 and Sharp
Burlington, KS 66839

Doyle Adams
Chief Nuclear Engineer
Arkansas Nuclear I
Entergy Operation
Route 6, Box 137G
Russellville, AR 72801

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Page 2

John Scroggins
Chief Civil Engineer
Arkansas Nuclear I
Entergy Operation
Route 6, Box 137G
Russellville, AR 72801

Bill Langloys
Lead Civil Engineer
Brunswick Nuclear Power Plant
P.O. Box 1551
Raleigh, NC 27602

Grant Chappell
CP & L
Robinson Nuclear Power Plant
P.O. Box 1551
Raleigh, NC 27602

John Maze
Procurement Engineer
Duane Arnold Nuclear Power Plant
3277 Daec Road
Palo, IA 52324

Mark Hutting
QA Engineer
Duane Arnold Nuclear Power Plant
3277 Daec Road
Palo, IA 52324

Mike Hook
Response Engineer
Duane Arnold Nuclear Power Plant
3277 Daec Road
Palo, IA 52324

Tim Tulon
Project Engineer
Commonwealth Edison Company
Byron Nuclear Power Plant
Box 586
Byron, IL 61010

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01/08/91 letter
Page 3

Tom Grothe
Design Control Engineer
Union Electric
Callaway Nuclear Power Plant
P.O. Box 620
Fulton, MO 65251

Richard Lutz
Mechanical Engineer
Union Electric
Callaway Nuclear Power Plant
P.O. Box 620
Fulton, MO 65251

Steve Reed
Mechanical Engineer
Union Electric
Callaway Nuclear Power Plant
P.O. Box 620
Fulton, MO 65251

Tony Petrowsky
Florida Power Corp.
Crystal River Nuclear Power Plant
P.O. Box 219
Crystal River, FL 32629

Joe Lese
Florida Power Corp.
Crystal River Nuclear Power Plant
P.O. Box 219
Crystal River, FL 32629

Frank Schwarz
Illinois Power Company
Clinton Nuclear Power Plant
Route 54, 6 miles East
P.O. Box 678
Clinton, IL 61727

Mike Siedlik
Civil/Structural Engineer
Nebraska Public Power District
Cooper Nuclear Power Plant
1414 15th Street
Columbus, NE 68601

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01/08/91 letter
Page 4

Ronald Yantz
Civil Engineer
Nebraska Public Power District
Cooper Nuclear Power Plant
1414 15th Street
Columbus, NE 68601

Sam Pande
Chief Engineer
Omaha Public Power District
Fort Calhoun Nuclear Power Plant
444 S. 16th St. Mall 7E/EP1
Omaha, NE 68102-2247

Jack Skiles
Chief Mechanical Engineer
Omaha Public Power District
Fort Calhoun Nuclear Power Plant
444 S. 16th St. Mall 7E/EP1
Omaha, NE 68102-2247

Tom Webb
Engineering/Technical Support Group
Wisconsin Public Service Corp.
Kewaunee Nuclear Power Plant
Route 1, Box 48
Kewaunee, WI 54216

Mark McKeown
Chief Engineer
Northern States Power Co.
Prairie Island Nuclear Power Plant
1717 Wakonade Drive East
Welch, MN 55089

Gene Sabatis
Project Engineer
Northern States Power Co.
Prairie Island Nuclear Power Plant
1717 Wakonade Drive East
Welch, MN 55089

Dave Craddick
Project Engineer
Commonwealth Edison Co.
Quad Cities Nuclear Power Plant
P.O. Box 216
Cordova, IL 61242

Nuclear Plants
01/08/91 letter
Page 5

Frank Stidhin
Civil Engineer
Belefonte Nuclear Power Plant
P.O. Box 2000
Hollywood, AL 35752

Rick Cutsinger
Lead Civil Engineer
Browns Ferry Nuclear Power Plant
P.O. Box 2000
Decatur, AL 35601

Sonny Koski
Lead Civil Engineer
Southern Co. Services, Inc.
Hatch Nuclear Power Plant
P.O. Box 2625
Birmingham, AL 35202

Ronald Peterson
Civil Engineer
Northern States Power Co.
Monticello Nuclear Power Plant
2807 W. Highway 75
Monticello, MN 55362

Mel Maxwell
Lead Civil Engineer
TVA
Sequoyah Nuclear Power Plant
P.O. Box 2000
Decatur, AL 35601

Anil Jha
Civil Engineer
Vogtle Nuclear Power Plant
P.O. Box 1600
Waynesboro, GA 30830

Newton Perry
Structural Superintendant
Watts Bar Nuclear Power Plant
P.O. Box 800
Spring City, TN 37381

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01/08/91 letter
Page 6

Newton Perry
Structural Superintendent
Watts Bar Nuclear Power Plant
P.O. Box 800
Spring City, TN 37381

Tom Sikavitsas
Consumers Power Company
Big Rock Point Nuclear Power Plant
10269 U.S. 31 H'way North
Charlevoix, MI 49106

Fai Chan
Consumers Power Co.
Palisades Nuclear Power Plant
27780 Blue Star Memorial H'way
Covert, MI 49043

Marvin Lohman
Commonwealth Edison Company
Braidwood Station
R.R. 1, Box 84
Braceville, IL 60407

D. VanPelt
Commonwealth Edison Company
Dresden Nuclear Power Plant
R.R. 1
Morris, IL 60450

William Sheldon
Commonwealth Edison Company
Lasalle County Nuclear Power Plant
R.R. 1, Box 220
2601 N. 21st Road
Marseilles, IL 61341

Robert Johnson
Commonwealth Edison Company
Zion Nuclear Power Plant
Shiloh Blvd. & Lake Michigan
Zion, IL 60099

Don Ward, P.E.
Baltimore Gas & Electric
Calvert Cliffs Nuclear Power Plant
Route 2 & 4
Lusby, MD 20657

Nuclear Plants
01/08/91 letter
Page 7

Jerry Bischof, P.E.
Virginia Power Co.
North Anna Nuclear Power Plant
Skobn Building
P.O. Box 41
Mineral, VA 23117

Chuck Hogg
Chief Engineer
Comanche Peak Steam Electric Station
P.O. Box 1002
Glen Rose, TX 76043

Dub Barfield
Structural Engineer
Grand Gulf
System Energy Resources
P.O. Box 429
Port Gibson, MS 39150

Joe Montalbano
Structural Engineer
Grand Gulf
System Energy Resources
P.O. Box 429
Port Gibson, MS 39150

Nayan Deshpande
Structural Engineer
Grand Gulf
System Energy Resources
P.O. Box 429
Port Gibson, MS 39150

G. Thomas Westbrook
Engineer 1
Beaver Valley Nuclear Power Plant
Nuclear Engineering Dept.
P.O. Box 321
Shippingport, PA 15077

I-Chen Huang
Indiana Michigan Power Co.
Cook Nuclear Power Plant
One Cook Place
Bridgman, MI 49106

Nuclear Plants
01/08/91 letter
Page 8

Jon G. Hook
Senior Nuclear Engineer
Davis-Besse Nuclear Power Plant
5501 North State, Route 2
Oak Harbor, OH 43449

Abdul Alchalabi
Supervisor, Nuc. Eng.
Ferme Nuclear Power Plant
6400 North Dixie Highway
Newport, MI 48166

Ray Brown
Nuclear Engineer
RG & E
Ginna Nuclear Power Plant
89 East Avenue
Rochester, NY 14649-001

Curtis R. Angstadt
Senior Design Engineer
Perry Nuclear Power Plant
10 N. Center Road
Perry, OH 44081

Tyler
Alabama Power Company
Farley Nuclear Power Plant
Highway 95 South
Columbia, AL 36319

Bruce Beisler
Lead Civil Engineer
Florida Power Corp.
St. Lucie Nuclear Power Plant
P.O. Box 14000
Juno Beach, FL 33408-0420

Tom Carter
Lead Civil Engineer
Florida Power Co.
Turkey Point Nuclear Power Plant
P.O. Box 3088
Florida City, FL 33034-3088

Nuclear Plants
01/08/91 letter
Page 9

Benny Lenox
Acting Chief Structural Engineer
GSU River Bend Nuclear Power Plant
P.O. Box 220
St. Francisville, LA 70775

John Burke
LP & L
Waterford Nuclear Power Plant
P.O. Box B
Kilona, LA 70066

Ted Bushnell
Chief Structural Engineer
Portland General Electric
Trojan Nuclear Power Plant
Mail Drop TNB-2
71760 Columbia River Highway
Rainier, OR 97048

Larry Noble
Supervisor Civil Engineering
WPPSS Nuclear Power Plant
Engineering Dept.
3000 George Washington Way
Richland, WA 99357

Eric Sole
Engineering
Main Yankee Atomic Power Co.
Main Yankee/Yankee Rowe Nuclear Power Plant
P.O. Box 408
Wiscasset, ME 04578

Bill Hepburn
Engineering
Main Yankee Atomic Power Co.
Main Yankee/Yankee Rowe Nuclear Power Plant
P.O. Box 408
Wiscasset, ME 04578

Jim Calcherra
Construction Engineer
Yankee Atomic Electric Co.
Vermont Yankee Nuclear Power Plant
Site P.O. Box 157
Governor Hunt Road
Vernon, VT 05354

Nuclear Plants
01/08/91 letter
Page 10

Mike Badovini
Site Engineer
Yankee Atomic Electric Co.
Vermont Yankee Nuclear Power Plant
Site P.O. Box 157
Governor Hunt Road
Vernon, VT 05354

Jim Devinantis
Site Engineer
Yankee Atomic Electric Co.
Vermont Yankee Nuclear Power Plant
Site P.O. Box 157
Governor Hunt Road
Vernon, VT 05354

Dave Bower
Engineering
Yankee Atomic Electric Co.
Vermont Yankee Nuclear Power Plant
Site P.O. Box 157
Governor Hunt Road
Vernon, VT 05354

Nelson McLean
Engineering
Seabrook-N.H. Yankee
Division of Public Service Co. of N.H.
P.O. Box 300
Seabrook, NH 03874

R.L. Engen
Structural Engineer
South Texas Nuclear Power Plant
P.O. box 1700
Houston, TX 77001

Tom Starr
Conneticut Yankee Nuclear Power Plant
Haddam Neck, CT

Phil George
Superintendant of Structural Design
Niagara Mohawk
Nine Mile Point Nuclear Power Plant
301 Plainfield Rd
Syracuse, NY 13212

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Page 11

Chris Sawatzke
Engineering
Niagara Mohawk
Nine Mile Point Nuclear Power Plant
301 Plainfield Rd.
Syracuse, NY 13212

Tom Starr
Engineering
Millstone Nuclear Power Plant
Waterford, CT

Frank Sisto
PSE & G
Salem/Hope Creek Nuclear Power Plants
P.O. Box 236
Hancocks Bridge, NJ 08038

Richard Daniels
Philadelphia Electric Co.
Limerick/Peach Bottom Nuclear Power Plants
M.S. N2-1
2301 Market Street
Philadelphia, PA 19101

Werner Haas
Site Liaison Engineer
Oyster Creek Nuclear Station
P.O. Box 388
Forked River, NJ 08731

John Swankoski
Pennsylvania Power & Light
Susquehanna Nuclear Power Plant
2 North 9th Street
A6-3
Allentown, PA 18101

Ted Noble
Technical Functions
Three Mile Island Nuclear Station
RTE 441 South
P.O. Box 480
Middletown, PA 17057

Nuclear Plants
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Page 12

Peter Gallagher
Civil Engineering
Consolidated Edison Co.
Indiana Point 2 Nuclear Power Plant
RM 1028
4 Irving Place
New York, NY 10003

Richard Drake
New York Power Authority
Indiana Point 3 Nuclear Power Plant
123 Main Street
12th Floor
White Plains, NY 10601

Gary Dyckman
Boston Edison
Pilgrim Nuclear Power Plant
25 Braintree Hill Office Park
Braintree, MA 02184

Lee Klosowski
Manager, Nuclear Design
Niagara Mohawk
Nine Mile Point Nuclear Power Plant
301 Plainfield Rd.
Syracuse, NY 13212

Larry Prunotto
Manager, Nuclear Design
Niagara Mohawk
Nine Mile Point Nuclear Power Plant
301 Plainfield Rd.
Syracuse, NY 13212

Keith Ward
Superintendent of Structural Design
Niagara Mohawk
Nine Mile Point Nuclear Power Plant
301 Plainfield Rd.
Syracuse, NY 13212

Brian Folgerait
Structural Engineer
NY Power Authority
J.A. Fitzpatrick Nuclear Power Plant
P.O. Box 41
Lycoming, NY 13093

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Page 13

DePak Banarjee
NY Power Authority
J.A. Fitzpatrick Nuclear Power Plant
P.O. Box 41
Lycoming, NY 13093

Thomas Moskalyck
Chief Structural Engineer
NY Power Authority
J.A. Fitzpatrick Nuclear Power Plant
P.O. Box 41
Lycoming, NY 13093

Bill Henries
Chief Structural Engineer
Maine Yankee Atomic Power Co.
Maine Yankee Nuclear Power Plant
580 Main Street
Bolton, MA 01740

Jerry Wojcik
Seabrook-N.H. Yankee Nuclear Power Plant
Division of Public Service Co. of N.H.
580 Main Street
Bolton, MA 01740

Cliff Greeno
Yankee Atomic Electric Co.
Vermont Yankee Nuclear Power Plant
580 Main Street
Bolton, MA 01740

Dr. John Parker
Main Yankee Atomic Electric Co.
Yankee Rowe Nuclear Power Plant
580 Main Street
Bolton, MA 01740

Boeschen
Main Yankee Atomic Electric Co.
Yankee Rowe Nuclear Power Plant
580 Main Street
Bolton, MA 01740

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Michael Yan
Senior Civil Engineer
Civil Engineering Department
Pacific Gas & Electric
Diablo Canyon Nuclear Power Plant
333 Market Street, RM 1-1189
San Francisco, CA 94106

Jeff Fisher
Nuclear Engineering Department
Arizona Public Service
Palo Verde Nuclear Power Plant
411 North Central, Station 1202
Phoenix, AZ 65004

Thomas Kato
Supervising Engineer
Nuclear Engineering Design Organization
Nuclear Engineering, Safety & Lic.
San Onofre Nuclear Power Plant
23 Parker Street
Irvine, CA 92718

Bruce Sasman
Wisconsin Electrical Power
Point Beach Nuclear Power Plant
231 West Michigan Street
Milwaukee, WI 53201

Al Fletcher, P.E.
Virginia Power Co.
Surry Power Station
P.O. Box 376
Surry, VA 23883

Clint Gladding
Engineering Superintendant
Conneticut Yankee Nuclear Power Plant
P.O. Box 127
East Hampton, CT 06424

Bruce Danielson
Maintenance Manager
Conneticut Yankee Nuclear Power Plant
P.O. Box 127
East Hampton, CT 06424

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Page 15

Bill Vogel
Engineering Superintendent
Millstone Nuclear Power Plant
Unit 1
P.O. Box 128
Waterford, CT 06385

Niel Bergh
Maintenance Superintendent
Millstone Nuclear Power Plant
Unit 1
P.O. Box 128
Waterford, CT 06385

John Riley
Maintenance Superintendent
Millstone Nuclear Power Plant
Unit 2
P.O. Box 128
Waterford, CT 06385

Brenden Duffy
Engineering Superintendent
Millstone Nuclear Power Plant
Unit 2
P.O. Box 128
Waterford, CT 06385