Appendix D

References

This page intentionally left blank

Hydraulic Design of Labyrinth Weirs and Fusegates - Falvey

Labyrinth Weirs

Afshar, A., (1988). "The development of labyrinth weir design." *Water Power and Dam Construction*, 40(5), 36-39.

Cassidy, J.J., Gardner, C.A., and Peacock, R.T., (1985). "Boardman labyrinth crest spillway." *American Society of Civil Engineering, Journal of Hydraulic Engineering*, 111(3), 398-416.

Cassidy, J.J., Gardner, C.A., and Peacock, R.T., (1985). "Closure to 'Boardman labyrinth crest spillway." *American Society of Civil Engineering*, Journal *of Hydraulic Engineering*, 111(6), 808-819.

Chandrasekhara, T.R., and Loganathan, V., (1985). "Discussion of Boardman labyrinth crest spillway." *American Society of Civil Engineering, Journal of Hydraulic Engineering*, 111(6), 808-819.

Darvas, L.A., (1971). "Discussion of 'Performance and design of labyrinth weirs,' by Hay and Taylor." *American Society of Civil Engineering*, Journal *of Hydraulic Engineering*, 97(80), 1246-1251.

El-Khashab, A.M.M., and Smith, K.V.M, (1976). "Experimental investigations of flow over side weirs." *American Society of Civil Engineering, Journal of Hydraulic Engineering*, 102(9), 1255-1268.

Falvey, H.T., (2003), Hydraulic Design of Labyrinth Weirs, ASCE Press.

Hay, N., and Taylor, G., (1970). "Performance and design of labyrinth weirs." *American Society of Civil Engineering, Journal of Hydraulic Engineering*, 96(11), 2337-2357.

Hinchliff, D., and Houston, K.L., (1984). "Hydraulic design and application of labyrinth spillways." *Proceedings of 4th Annual USCOLD Lecture*, January.

Indlekofer, H., and Rouvé, G., (1975). "Discharge over polygonal weirs." *American Society of Civil Engineering, Journal of the Hydraulics Division*, 101(HY3), 385-401.

Lux, F., (1984). "Discharge characteristics of labyrinth weirs." *Proceedings of Conference on Water for Resource Development*, Coeur d'Alene, ID, Aug, American Society of Civil Engineering.

Lux, F. (1985). "Discussion on Boardman labyrinth crest spillway." *American Society of Civil Engineering, Journal of Hydraulic Engineering*, 111(6), 808-819.

Lux, F., and Hinchliff, D.L., (1985). "Design and construction of labyrinth spillways." *15th Congress ICOLD*, *Vol. IV*, *Q59-R15*, Lausanne, Switzerland, 249-274.

Lux, F., (1989), "Design and application of labyrinth weirs," *Design of Hydraulic Structures 89*, Edited by Albertson, M.L., and Kia, R.A., Balkema/Rotterdam/Brookfield.

Mayer, P.G., (1980). "Bartletts Ferry Project, labyrinth weir model studies." *Project No. E-20-610*, Georgia Institute of Technology, Atlanta, Ga., Oct.

Megalháes, A.P., (1985). "Labyrinth weir spillway." *Transactions of the 15th Congress ICOLD, Vol. VI, Q59-R24*, Lausanne, Switzerland, 395-407.

Megalháes, A.P., and Melo, J.F., (1994). "Hydraulic model study of a large labyrinth weir spillway." 2nd International Conference on Hydraulic Modeling, Stratford-upon-Avon, U.K., June.

Metropolitan Water, Sewerage and Drainage Board, (1980). "Investigation into spillway discharge noise at Avon Dam." *ANCOLD Bulletin No. 57*, 31-36.

Tacail, F.G., Evans, B., and Babb, A., (1990). "Case study of a labyrinth spillway." *Canadian Journal of Civil Engineering*, 17, 1-7.

Tullis, J.P., Nosratollah, A., and Waldron, D., (1995). "Design of labyrinth spillways." *American Society of Civil Engineering, Journal of Hydraulic Engineering*, 121(3), 247-255.

Vermeyen, T., (1991). "Hydraulic model study of Ritschard Dam spillways." *Report No. R-91-08*, U.S. Bureau of Reclamations, Denver, Colo.

Waldron, D.R., (1994). "Design of labyrinth spillways." MSc thesis, Utah State University, Logan, Utah.

Wormleaton, P.R., and Soufiani, E, (1998). "Aeration performance of triangular planform labyrinth weirs." *American Society of Civil Engineering, Journal of Environmental Engineering*, 124(8), 709-719.

Wormleaton, P.R., and Tsang, C.C., (2000). "Aeration performance of rectangular planform labyrinth weirs." *American Society of Civil Engineering, Journal of Environmental Engineering*, 127(5), 456-465.

Yildiz, D. and Uzecek, E., (1996). "Modeling the performance of labyrinth spillways." *Hydropower*, 3, 71-76.

Fusegates

Ait Alla, A., 1996, "The role of Fusegates in dam safety," Hydropower and Dams, Vol. 3, Issue 6.

Bowers, P.W., Mifkovic, C.S. and Rayssiguier, 2000, "Searching for conventional spillway control system alternatives," Hydropower and Dams, Issue 3, Jul.

Brink, T.G, 1996, "The Effects of Waves on Fusegates," MS Thesis, Colorado State University, Fort Collins, CO.

Compte, B., Golliard, D., Boillat, J.L., Chevalier, S., and Bremen, R., 2000, "Advances in spillway design using Fusegates: Application to the Montsalvens Dam," International Commission on Large Dams, 20th Congress on Large Dams, Beijing, China.

Falvey, H.T., Snell, E.F.A, and Rayssiguier, J.,1994, "Increasing Shongweni Dam Discharge Capacity with a Hydroplus Fusegate System," Dam Safety Modification and Rehabilitation, 14th Annual USCOLD Lecture Series, Phoenix, AZ, June.

Falvey, H.T. and Treille, P., 1995, "Hydraulics and Design of Fusegates," ASCE Journal of Hydraulic Engineering, Vol. 121, NO. 7, July.

Fauquez, J.P., 1993, "Hydroplus and the Fusegate principle," International Conference, Hydropower, Energy and the Environment, Stockholm, June.

Garrec, P., 1998, "Fusegates increase storage capacity at four dams in Gujarat," Hydropower and Dams, Issue 5.

Golliard, D. and Chevalier, S., 1998, "An innovative solution to a safety problem on Montsalvens dam," Hydropower and Dams, Issue 2.

Gulati, O.T., 1996, "Increasing the capacity of the Mahi canal at Mahi, India," Hydropower and Dams, Issue 2.

Harshbarger, E.D., 1994, "Hydroplus Fusegate Evaluation," Tennessee Valley Authority, Report No. WR 28-1-900-259.

Hite, J. Jr. and Mifkovic, C., 2000, "Increasing Reservoir Storage or Spillway Capacity using Fusegates," U.S. Army Corps of Engineers, Apr.

Jones, S.J., Spencer, D., Rodionov, V.B., Lounatsi, M.E. and Ait Alla, A., 1996, "The reliability of fuseible gates in ice-affected environments," Hydropower and Dams, Issue, 2.

Lempériére, F. and Bessiére, C., 1992, "Hydroplus submersible fusegates for surface spillways," Modification of dams to accommodate major floods, Twelfth Annual USCOLD Lecture Series, Fort Worth, TX.

Lempériére, F., 1992, "Overspill Fusegates," Water Power & Dam Construction, July

Lempériére, F., 1995, "Cost Effective improvements in fill dam safety," Hydropower and Dams, Jan.

Pittman, W.V, Watson, M.D., and Hakin, W.D., 1998, "Impact of fusegate rotation on a reservoir's firm yield," Hydropower and Dams, Issue 6.

Shaw, Q.H.W., Cameron-Ellis, D.G., and Hakin, W.D., 1999, "Fusegates enhance safety and increase capacity at Eikenhof," Hydropower and Dams, Issue 6, Dec.

Sikora, J., Ferns, L., Bailey, F. and Gavillet, M., 1995, "MacClure dam spillway modifications with Fusegates," Proceedings of the 1995 Annual Conference of the Association of Dam Safety Officials, Sep., pp. 17-20, Atlanta, GA.

Taylor, G., Mahooty, D., and Rayssiguier, J., 2001, "Historic Dam, Modern Upgrade," USSD Conference, Denver.

Trissler M. and Crawford, C., 1994, "Installation of a Fusegate system at Shongweni dam," Hydropower and Dams, Nov.

Verrender, M., Mayo, N., Phillippe, M., 1994, "Recent development with Hydroplus Fusegates," Australian National Committee on Large Dams, Dec., Hobart, Tasmania.

Yong, Liu, 1995, "Application of Hydroplus Fusegates to flood-diversion areas of Huaihe river basin," Hydropower and Dams, Nov.

Yziquel, A., Monclar, J.M., and Chirwa, M.J., "Heightening of Malawi's Kamuzu II Dam" Hydropower and Dams, Issue 6, Dec.

Fuse Plug Embankments - Wahl

Tinney, E.R. and Hsu, H.Y., 1961. Mechanics of washout of an erodible fuse plug. *Journal of the Hydraulic Division*, Proceedings, ASCE, Vol. 87, No. HY3, May 1961.

Pugh, C.A., 1985. *Hydraulic Model Studies of Fuse Plug Embankments*, U.S. Dept. of the Interior, Bureau of Reclamation, Research Report REC-ERC-85-7. http://www.usbr.gov/pmts/hydraulics_lab/pubs/recerc/REC-ERC-85-07.pdf

Crest Parapets and Dam Raising - Fuller

Dam Safety Assurance Model Study of Tygart Dam, Tygart River, Grafton, West Virginia, Turner, Herman O., TR CHL-99-7, April 1999.

Bluestone Lake Dam, West Virginia, Rating Curve and Overtopping Study, Fuller, Billy D., ERDC/CHL TR-02-2, March 2002.

Gated Spillways Both Traditional and Rubber - Cohen

Manuals Design of Arch Dams, 1977 Design of Gravity Dams, 1976 Design of Small Canal Structures, 1978 Design of Small Dams, 1987 Guide to Concrete Repair, 1999 SEED (Safety Evaluation of Existing Dams), Revised Reprint 1983

Design Standards

Design Standards No. 3 (Revised), Water Conveyance Systems Chap. 4, Tunnels, Shafts, and Caverns, 1994 Chap. 11, General Hydraulic Considerations, 1994 Chap. 12, General Structural Considerations, 1994

Engineering Monographs

No. 7, Friction Factors for Large Conduits Flowing Full, 1977
No. 9, Discharge Coefficients for Irregular Overfall Spillways, 1952
No. 25, Hydraulic Design of Stilling Basins and Energy Dissipators, Revised 1978

Research Report No. 4, Hydraulic Downpull Forces on Large Gates, 1966

Research Reports

REC-ERC Research Reports
REC-ERC-78-8, Low Froude Number Stilling Basin Design, 1978
REC-ERC-85-7, Hydraulic Model Studies of Fuse Plug Embankments, 1985
REC-ERC-87-6, Hydraulic Model Studies of Upper Stillwater Dam Stepped Spillway and Outlet Works, 1987
REC-ERC-88-1, Emergency Spillways Using Geomembranes, 1988
REC-ERC-88-2, Hydraulic Model Study of Twin Buttes Dam Fuse Plug Spillway, 1988
REC-ERC-88-3, Overtopping Flow on Low Embankment Dam-Summary Report of Model Tests, 1988
R-03-02, A Survey of Selective Withdrawal Systems, 2003

ACER Technical Memoranda

Freeboard Criteria and Guidelines for Computing Freeboard Allowances for Storage Dams, ACER Technical Memorandum No. 2, 1992

Criteria and Guidelines for Evacuating Storage Reservoirs and Sizing Low-Level Outlet Works, ACER Technical Memorandum No. 3, 1990

Criteria for Bulkheading Outlet Works Intakes for Storage Dams, ACER Technical Memorandum No. 4, 1982

Guidelines for Determining Whether Normally Inundated Outlet-Works Features Should Be Examined, ACER Technical Memorandum No. 6, 1985

Guidelines for Designing and Constructing Roller-Compacted Concrete Dams, ACER Technical Memorandum No. 8, 1987

Guidelines for Controlling Seepage Along Conduits through Embankments, ACER Technical Memorandum No. 9, 1987 Guidelines for Using Fuse Plug Embankments in Auxiliary Spillways, ACER Technical Memorandum No. 10, 1987

Earthen Spillways Design and Analysis – State of the Practice - Temple

Annandale, G. W. (1995). "Erodibility." Journal of Hydraulic Research, IAHR, Vol. 33, No. 4, 471-494.

Barton, N. 1988. "Rock Mass Classification and Tunnel Reinforcement Selection Using the Q-System." <u>Rock Classification Systems for Engineering Purposes</u>. Kirkaldie, L., ed., ASTM STP 984, American Society for Testing and Materials, Philadelphia, 59-88.

Bollaert, E., Falvey, H.T., Schleiss, A. (2002). "Turbulent jet impingement in plunge pools: the particular characteristics of a near-prototype physical model study." Proceedings of Riverflow 2002, Louvain-la-Neuve, Belgium, 395-403.

Cato, K.D. 1991. "Performance of Geological Material Under Hydraulic Stress," Ph.D. diss., Texas A&M University, College Station, Texas.

Hanson, G.J., 1991, "Development of a Jet Index to Characterize Erosion Resistance of Soils in Earthen Spillways," <u>Trans. ASAE</u>, Vol. 34, No. 5: 2015-2020.

Kirsten, H.A.D. 1988. "Case Histories of Groundmass Characterization for Excavatability. Kirkaldie, L., ed., <u>Rock Classification Systems for Engineering Purposes</u>. ASTM STP 984, American Society Society for Testing and Materials, Philadelphia, PA, pp. 102-120.

Mathewson, C., Cato, K.D., and May, J. 1998. "Geotechnical Aspects of Rock Erosion in Emergency Spillway Channels." Supplemental Information on Prediction, Control, and Repair of Erosion in Emergency Spillway Channels, USACE-WE, Vicksburg, MS.

Moore, J.S., Temple, D.M., and Kirsten, H.A.D. 1994. "Headcut Advance Threshold in Earth Spillways." <u>Bulletin of the Association of Engineering Geologists</u>, Vol. XXXI, No. 2, pp. 277-280.

Perlea, V.G., Mathews, D.L., and Walberg, F.C. 1997. "Rock Erosion of Unlined Spillway Chute." Nineteenth Congress on Large Dams (ICOLD), Florence, Italy.

Temple, D.M., and Hanson, G.J. 1994. "Headcut Development in Vegetated Earth Spillways, <u>Applied Engineering in Agriculture</u>, Vol 10, No 5: 677-682.

Temple, D.M., and Moore, J.S. 1997. "Headcut Advance Prediction for Earth Spillways." <u>Trans. ASAE</u>, Vol. 40, No. 3: 557-562.

US Army Corps of Engineers. 1990. "Hydraulic Design of Spillways," Engineer Manual EM 1110-2-1603, Washington, DC.

US Army Corps of Engineers. 1994. "Hydraulic Design of Flood Control Channels," Engineer Manual EM-1110-2-1601, Washington, DC.

US Department of Agriculture, SCS. 1973. A guide for design and layout of earth emergency spillways as part of emergency spillway systems for earth dams. Technical Release No. 52.

US Department of Agriculture, NRCS. 1997. "National Engineering Handbook, Part 628 Dams, Chapter 51, Earth Spillway Erosion Model." Washington, D.C.

US Department of Agriculture NRCS. 2001. "National Engineering Handbook, Part 628 Dams, Chapter 52, Field Procedure Guide for the Headcut Erodibility Index." Washington, D.C.

Wibowo, J. L. And Murphy, 2002. "Unlined Spillway Erosion Prediction Model" WES Technical Report.

Spillway Foundation Erosion - Ruff

Jet Scour

Annandale, G.W., (1995), "Erodibility." *Journal of Hydraulic Research*, Vol. 33, No. 4, pp. 471-494.

Bollaert, Eric, (2002), "Transient water pressures in joints and formation of rock scour due to high-velocity jet impact," Thesis, Swiss Federal Institute of Technology, Lausanne, Switzerland.

Annandale, G.W., Wittler, R.J., Scott, G., (2000), "Scour Downstream of Dams" Proceedings of the GeoEng 2000 Conference, Melbourne, Australia. Ed. Jean Louis Briaud. November.

Bohrer, J., Abt, S.R., Wittler, R.J., (1998), "*Predicting Plunge Pool Velocity Decay of a Free falling, Rectangular Jet.*" Journal of Hydraulic Engineering, American Society of Civil Engineers. October 1998, vol. 124, issue 10. pp 1043-1048.

Harza Engineering Company, (1993), "Plunge pool performance – Project data review/Literature search," Theodore Roosevelt Dam, Lower Colorado Region, Salt River Project, Arizona, Report prepared for U.S. Bureau of Reclamation, Denver Colorado.

Hoffman, G., (1998), "Jet scouring equilibrium phase." Journal of Hydraulic Engineering, American Society of Civil Engineers. October, vol. 124, issue 10. pp 430-437.

Kuroiwa, J.M, Ruff, J.F., Wittler, R.J., Annandale, G.W., (1998), "*Prototype Scour Experiments in Simulated Fractured Rock and Granular Media*." Proceedings of 1998 ASCE International Water Resources Engineering Conference, Memphis, TN, August.

Kuroiwa, J.M, (1999), "Scour caused by rectangular jets in cohesionless beds," Dissertation, Colorado State University, Fort Collins, Colorado.

Mason, P.J., Arumugam, K., (1985), "Free Jet Scour Below Dams and Flip Buckets." *Journal of Hydraulic Engineering*, vol. 111, No. 2, A.S.C.E., February.

Wittler, R.J., Annandale, G.W., Abt, S.R., Ruff, J.F., (1998), "*New Technology for Estimating Plunge Pool or Spillway Scour*." Proceedings of Association of State Dam Safety Officials, Dam Safety '98. Las Vegas, NV. October 11-15.

Riprap and Concrete Wedge Blocks

Gaston, M. L., (1995), "Air entrainment and energy dissipation on s stepped block spillway," Thesis, Colorado State University, Fort Collins, Colorado.

Mishra, S. K., (1998), "Riprap design for overtopped embankments," Dissertation, Colorado State University, Fort Collins, Colorado.

Slovensky, G. G., (1993), "Near-prototype testing of wedge-block overtopping protection," Thesis, Colorado State University, Fort Collins, Colorado.

Wittler, R. J., (1994), "Mechanics of riprap in overtopping flow," Dissertation, Colorado State University, Fort Collins, Colorado.

Dam Overtopping Protection Technologies - State-of-Practice and Research Needs - Frizell

Embankment Overlays

Matos, Jorge, Antonio N. Pinheiro, Antonio de Carvalho Quintela, Kathleen H. Frizell. 2001, "On the Role of Stepped Overlays to Increase Spillway Capacity of Embankment Dams," International Journal of Hydraulic Research, 2001

"Hydraulics of Stepped Spillways," *Proc Intl. Workshop on Hydraulics of Stepped Spillways*, Zürich, Switzerland, H.E. Minor & W.H. Hager (eds). Balkema: 163-170, 2000.

Oswalt, N.R., L.E. Buck, T.E. Hepler, and H.E. Jackson, "Alternatives for Overtopping Protection of Dams," ASCE Hydraulics Division Task Committee on Alternatives for Overtopping Protection for Dams, New York.

Frizell, K.H., B.W. Mefford, R. A. Dodge, T. B. Vermeyen, "Embankment Dams: Methods of Protection During Overtopping," *Hydro Review*, Vol. X, No. 2, April 1991.

Schweiger, Paul. G., "The State-of-the-Art of Armoring Embankment Dams Using Articulating Concrete Blocks," Proceedings ASDSO.

Baker, R. 2000a. The CIRIA guide for the design of stepped-block spillways. *Proc Intl. Workshop on Hydraulics of Stepped Spillways*, Zürich, Switzerland, H.E. Minor & W.H. Hager (eds). Balkema: 155-161.

Frizell, K.H., Matos, J. & Pinheiro, A.N. 2000. Design of concrete stepped overlay protection for embankment dams. *Proc Intl. Workshop on Hydraulics of Stepped Spillways*, Zürich, Switzerland, H.E. Minor & W.H. Hager (eds). Balkema: 179-186.

Frizell, K.H., Smith, D.H. & Ruff, J.F. 1994. Stepped overlays proven for use in protecting overtopped embankment dams. *Proc. of the Association of State Dam Safety Officials*, 11th Annual Conference, USA.

Riprap

Frizell, K.H., J.F. Ruff, and S. Mishra, "Simplified Design Guidelines for Riprap Subjected to Overtopping Flow," Proceedings of the Annual Association of State Dam Safety Officials (ASDSO) Conference, Las Vegas, NV, October 1998.

Mishra, S. K., (1998), "Riprap design for overtopped embankments," Dissertation, Colorado State University, Fort Collins, Colorado.

Timblin, Jr. L.O., P.G. Grey, B.C. Muller, and W.R. Morrison, "Emergency Spillways Using Geomembranes," REC-ERC-88-1, US Department of Interior, Bureau of Reclamation, Denver CO, April 1988.

Gabions

Oswalt, N.R., L.E. Buck, T.E. Hepler, and H.E. Jackson, "Alternatives for Overtopping Protection of Dams," ASCE Hydraulics Division Task Committee on Alternatives for Overtopping Protection for Dams, New York.

RCC Overtopping Protection for Increasing Spillway Capacity - Hansen

Hansen, K.D. and J. France, "RCC – A Dam Rehab Solution Unearthed," <u>Civil</u> <u>Engineering – ASCE</u>, September 1986.

Hansen, K.D. "RCC for Rehabilitation of Dams in the USA – An Overview," Roller Compacted Concrete III, Proceedings of the RCC Specialty Conference, San Diego, CA, ASCE, New York, February 1992, pp 22-46.

Hansen, K.D. and Bass, R.P. "How Old Dams are Reborn", <u>International Water Power &</u> <u>Dam Construction</u>, June 1999.

M^cLean, F.G. and K.D. Hansen, "Roller Compacted Concrete for Embankment Overtopping Protection," *Geotechnical Practice in Dam Rehabilitation*, Geotechnical Special Publication No. 35, Proceedings of the Geotechnical Engineering Division of ASCE, Raleigh, NC, April 1993, pp 188-209.

General discussion - NRCS Designs and Research Needs – James Moore

NRCS Technical Release No. 60 - Earth Dams and Reservoirs

Spillways - An Owner's Perspective - Weldon

NONE

General discussion – Consultant's Spillway Design and Research Needs - Wade Moore

NONE

Vegetated Earth Spillways - Inspection, Maintenance and Monitoring -Lobrecht

USDA – NRCS – National Engineering Manual 210-VI-NEM Part 628 Dams 210-VI-NEH-628.50 Chapters 50 Earth Spillway Design, 210-VI-NEH-628.51 Chapter 51 Earth Spillway Erosion Model, 210-VI-NEH-628.52 Chapter 52 Field Procedures Guide for the Headcut Erodibility Index. 210-VI-TR-60 TR-60 Earth Dams and Reservoirs 210-VI-NEH-728.50 SITES – Water Resource Site Analysis Computer Program

Earth Spillways – State of Practice and Research Needs - Greg Hammer

"HEC-RAS River Analysis System – Hydraulic Reference Manual", US Army Corps of Engineers, Hydrologic Engineering Center, Davis, CA, July 1995

Brater, Ernest F., King, Horace W., "Handbook of Hydraulics", Sixth Edition, McGraw-Hill Book Company, 1976.

Issues and Research Needs Related to Hydraulics for Spillways for State Regulated Dams - Fiegle .

Fiegle, E., "Issues and Research Needs Related to Hydraulics for Spillways for State Regulated Dams – State Survey Responses," Georgia Safe Dams Program, Georgia Department of Natural Resources, August 2003.

Concrete Spillway Repairs - McDonald

Vaysburd, A.M., Emmons, P.H., McDonald, J.E., Poston, R.W., and Kesner, K.E., "Performance Criteria for Concrete Repair Materials, Summary Report," Technical Report REMR-CS-62, 72 pp, US Army Engineer Waterways Experiment Station, Vicksburg, MS, March, 1999.

McDonald, J.E., Vaysburd, A.M., and Poston, R.W., "Performance Criteria for Dimensionally Compatible Repair Materials," *HPM&S Information Bulletin*, Vol 00-1, 13 pp, Engineer Research and Development Center, Vicksburg, MS, January 2000.

Inspection of Concrete Spillways – Gated and Uncontrolled - Bill Bouley

NONE

Geophysics for Spillway and Seepage Evaluation - Dunscomb

Corwin, R.W., and Butler, D.K., 1989, *Geotechnical Applications of the Self-Potential Methods; Report 3: Development of Self-Potential Interpretation Techniques for Seepage Detection*, Technical Report REMR-GT-6, Department of the Army, US Army Corps of Engineers, Washington, DC.

Dunscomb, Mark H. and Rehwoldt, Eric, 1999, *Two-Dimensional Resistivity Profiling; Geophysical Weapon of Choice in Karst Terrain for Engineering Applications,* Proceedings from the 7th Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karst, Harrisburg, PA

Dunscomb, Mark H., Rehwoldt, Eric, Matheson, Gordon M., 1999, *The New View: Two-Dimensional Resistivity*, 1999 Mid-Atlantic ASDSO Regional Conference, Matamoras, Pennsylvania.

Environmental & Engineering Geophysical Society, <u>http://www.eegs.org/</u>

Loke, M.H., 2001, *Electrical Imaging Surveys for Environmental and Engineering Studies* - A Practical Guide to 2D and 3D Electrical Imaging Surveys, Minden Heights, Malaysia, Distributed by <u>http://www.geoelectrical.com</u>

Reynolds, J.M., 1997, *An Introduction to Applied and Environmental Geophysics*, John Wiley and Sons, New York.

US Army Corps of Engineers, 1995, *Geophysical Exploration for Engineering and Environmental Investigations*, CECW-EG, EM 1110-1-1802, Washington, DC, for download at <u>http://www.usace.army.mil/inet/usace-docs/eng-manuals/em1110-1-</u> 1802/entire.pdf

Ward, S.H., ed., 1990, *Geotechnical and Environmental Geophysics*, Vol. 1, Society of Exploration Geophysicists, Tulsa, OK.

Inspection, Maintenance and Monitoring of Service and Emergency Spillways - Johnson

NONE

Unlined Spillway Erosion Risk Assessment - Koester

Annandale, G. W. 1995. "Erodibility." Journal of Hydraulic Research, IAHR, Vol. 33, No. 4, pp. 471-494.

Moore, J. S., Temple, D. M., and Kirsten, H. A. D. 1994. "Headcut Advance Threshold in Earth Spillways." Bulletin of the Association of Engineering Geologists, Vol. XXXI, No. 2, pp. 277-280.

Wibowo, J. L., and Murphy, W. L., 2004. "Unlined Spillway Erosion Prediction Model." WES Technical Report. in publication.

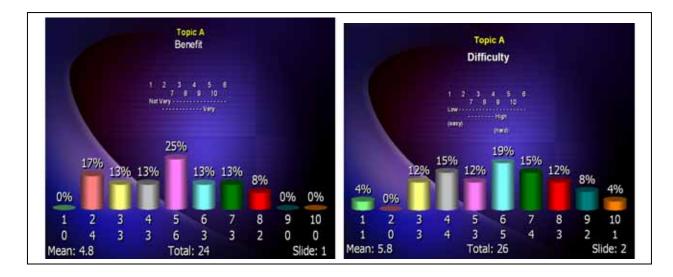
Mathewson, C., Cato, K. D., and May, J. 1998. "Geotechnical Aspect of Rock Erosion in Emergency Spillway Channels." Suplemental Information on Prediction, Control, and Repair o Erosion in Emergency Spillway Channels, USACE-WE, Vicksburg, MS.

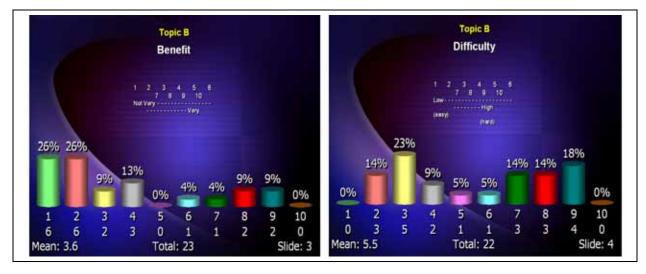
Appendix E

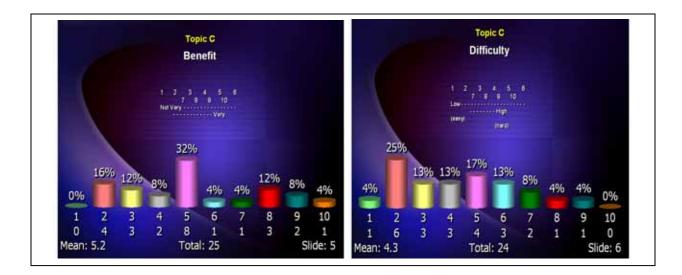
Individual Topic Voting Results

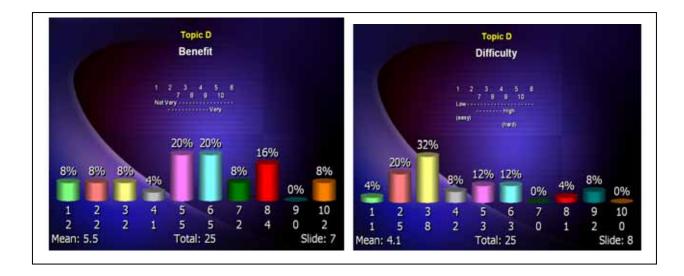
This appendix is a compilation of each topic difficulty and benefit result shown graphically. Each topic is shown side by side with benefit on the left and difficulty on the right of the figure box. The ratings were 1=not very beneficial, 10= very beneficial; 1=low difficulty or easy to accomplish, 10=high difficulty or very hard to accomplish. The numbers of votes received for each level of benefit or difficulty are shown across the bottom of each graph. The bars show the results of votes received. The mean is also shown for the category giving the voting distribution.

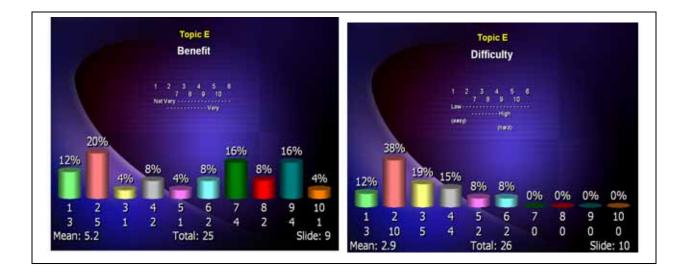
This page intentionally left blank.

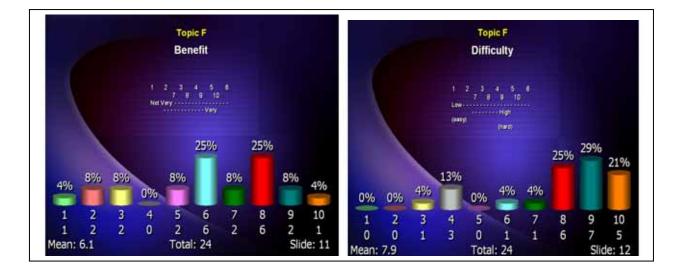




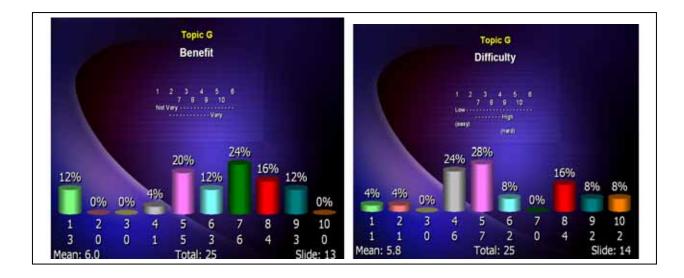


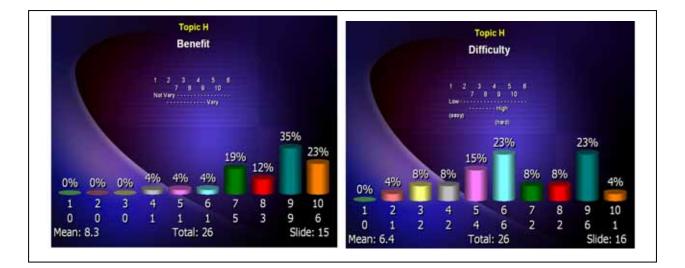


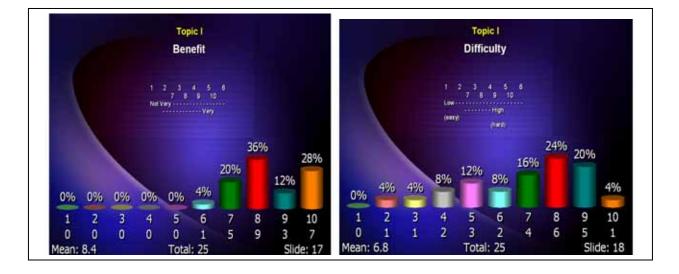




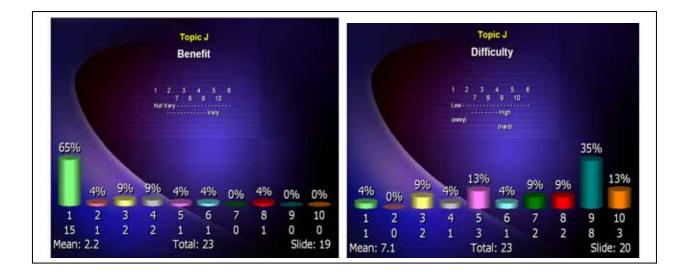
E-4 FEMA Workshop - Issues, Remedies and Research Needs Relating to Service and/or Emergency Spillways

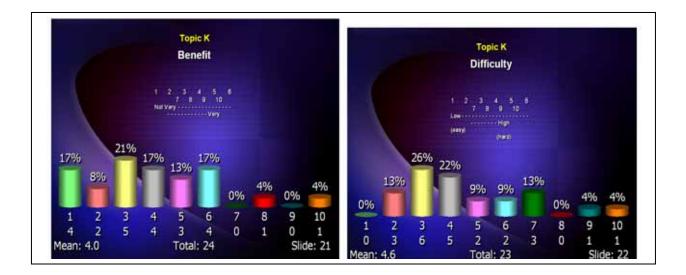


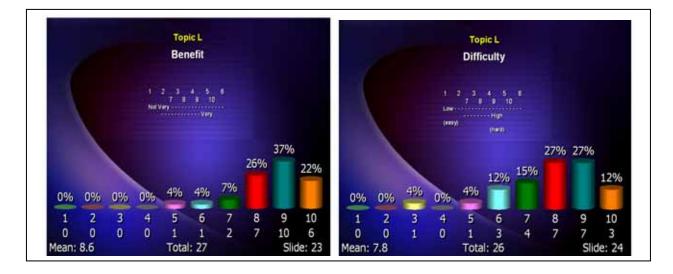




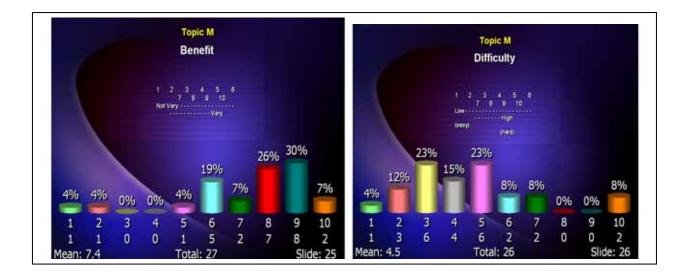
FEMA Workshop - Issues, Remedies and Research Needs Relating to Service and/or Emergency Spillways E-5

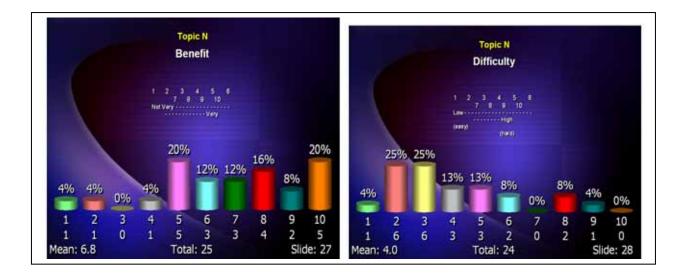


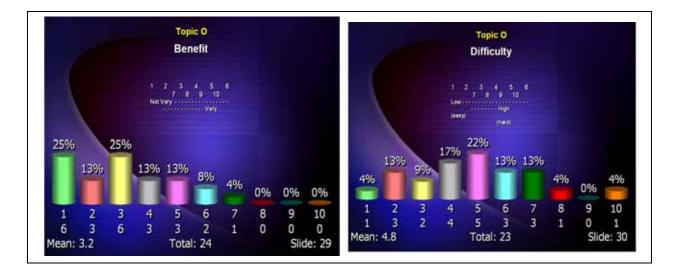




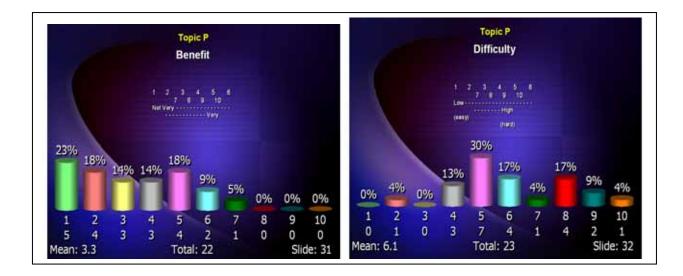
E-6 FEMA Workshop - Issues, Remedies and Research Needs Relating to Service and/or Emergency Spillways

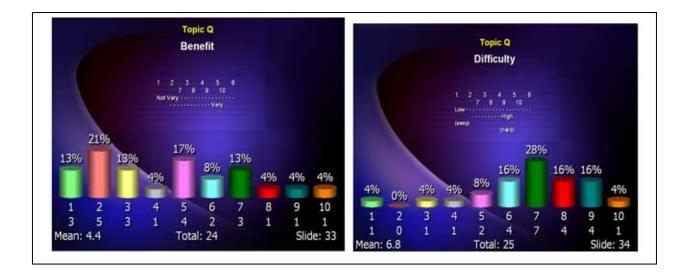


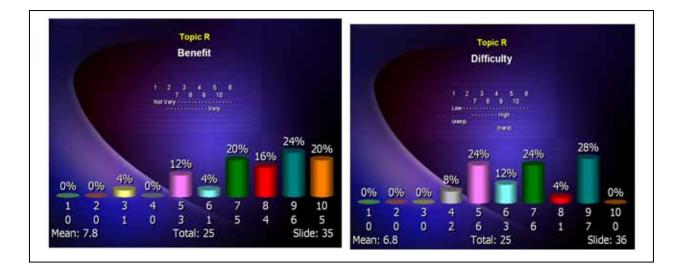




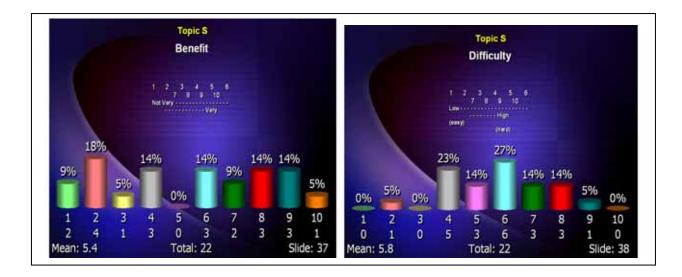
FEMA Workshop - Issues, Remedies and Research Needs Relating to Service and/or Emergency Spillways E-7

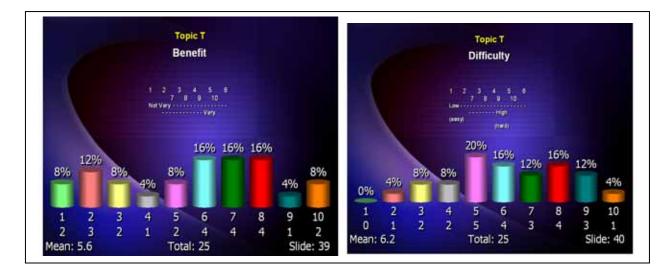


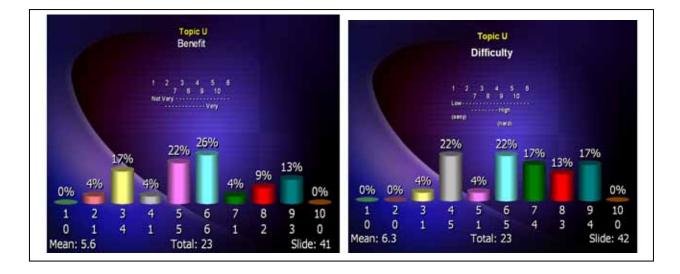


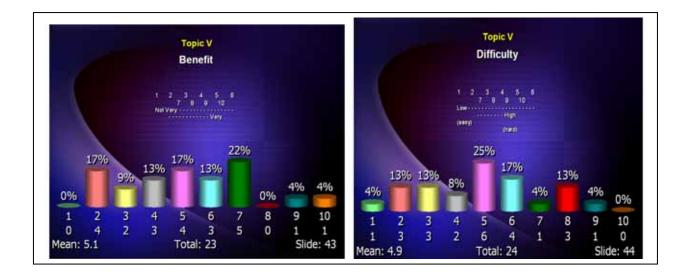


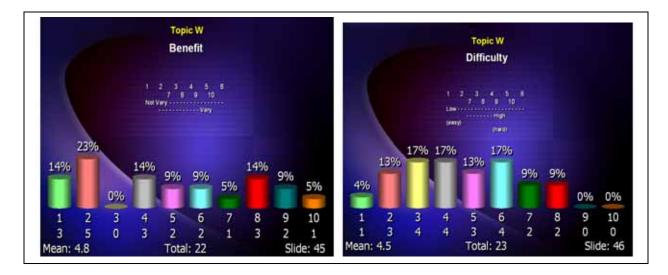
E-8 FEMA Workshop - Issues, Remedies and Research Needs Relating to Service and/or Emergency Spillways

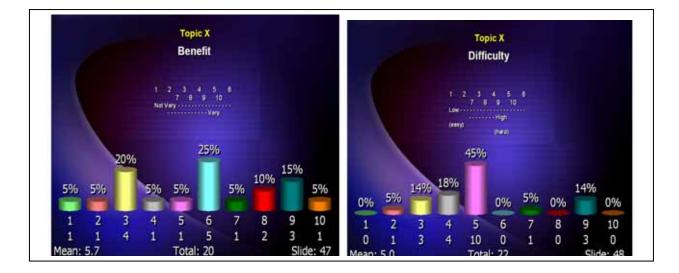




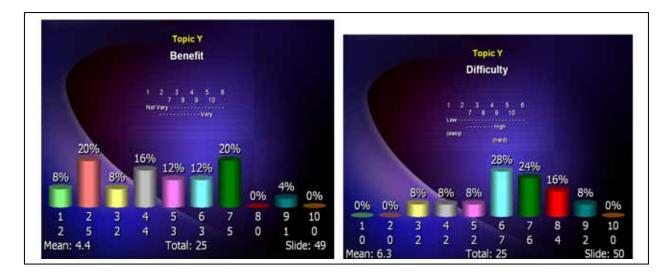


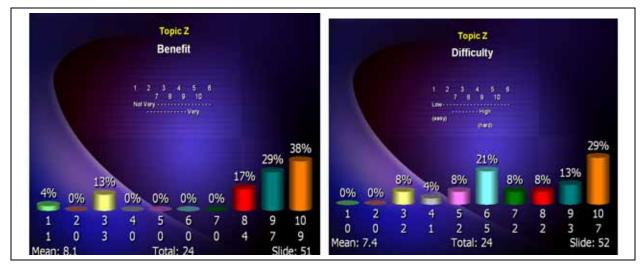


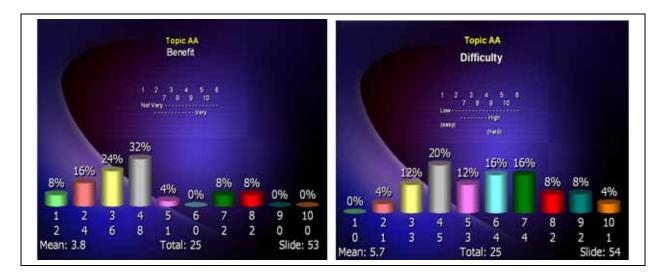


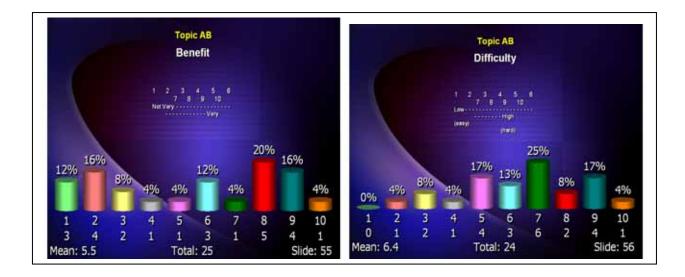


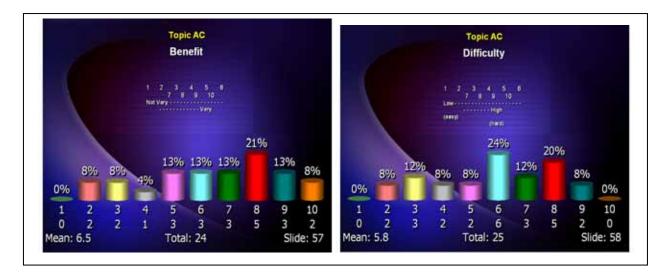
E-10 FEMA Workshop - Issues, Remedies and Research Needs Relating to Service and/or Emergency Spillways

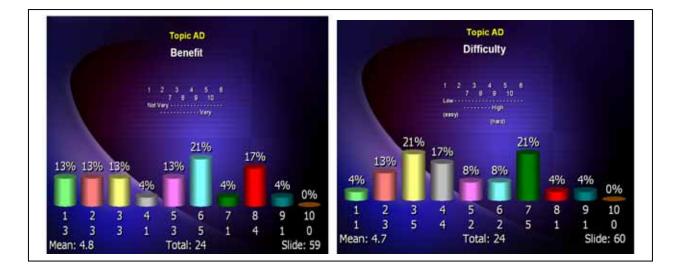












E-12 FEMA Workshop - Issues, Remedies and Research Needs Relating to Service and/or Emergency Spillways

