

**DRAFT**  
**Request for Guidance from RRP A on NERC GADS Wind Collection**  
**July 21, 2010**

**Executive Summary**

The North American Electric Reliability Corporation (NERC) Planning Committee (PC) formed a task force to determine if data collected by the NERC Generating Availability Data System (GADS) should be mandatory reporting for NERC registered generating companies. If mandatory reporting is approved, then dispatchable generating units and renewable units (wind and solar) would be affected by this ruling. IEEE Standard 762 is the basis for collecting data for dispatchable units; there is no standard for renewable units. If renewable units are considered for mandatory reporting, then there is a need to provide standard definitions for renewable units like there are for dispatchable units (IEEE 762.)

The purpose of this document is

- To provide information on what GADS has created to collect performance data on wind and
- To ask the IEEE Reliability Risk and Probability Applications Subcommittee (RRPA) for guidance as to what is the best way to help the mandatory effort.

**Introduction.**

The North American Electric Reliability Corporation (NERC) Generating Availability Data System (GADS) is moving towards mandatory reporting of conventional, dispatchable (fossil, nuclear, hydro, etc.) as well as renewable (wind and solar) generating units. The IEEE 762 “Standard Definitions for Use in Reporting Electric Generating Unit Reliability, Availability, and Productivity” has been the flagship of the GADS program for 30 years for dispatchable plants that operate 24 hours daily, 365 days per year. However, NERC GADS does not have and needs a uniform set of renewable unit (speaking mostly of wind) definitions and terms accepted by the wind industry to use in its data collection. If there were a standardized set of terms and definitions for renewable plants, then NERC GADS would have a consistent and uniform method to gather, edit, analyze and report wind turbine generator (WTG) data for use in resource planning, reliability analysis, benchmarking, and other important activities needed for adequacy of the bulk power supply.

GADS with great assistance from the wind industry has created a database for collecting and measuring the performance of wind turbines. We have had the comments and support of 85 members of the Wind Turbine Working Group (WTWG) for 2-½ years. (See attached list of WTWG members - Appendix A.) The WTWG has agreed to the terms, definitions, and approach to wind collection as outlined in “The GADS Wind Generation Data Reporting Instructions” (WDRI) dated January 1, 2010. See <http://www.nerc.com/page.php?cid=4|43|45>.

**The Reason for Action Now.**

On June 16, 2010, the NERC Planning Committee (PC) approved a GADS Task Force (GADSTF) to review and recommend if GADS should be mandatory reporting. The group will review the needs of both dispatchable as well as renewable generators. If GADS will be required reporting, then IEEE 762 is

already in place for dispatchable-type generating units. There is nothing in place for renewable units. (See attached GADSTF Scope – Appendix B.)

### **Discussion: IEEE 762 verses WTWG.**

As wind may very well be required reporting to GADS for its many users, it is important to define terms, definitions and equations for measuring the availability and reliability of WTG. Many terms in the WDRI comes from IEEE 762 and are identical; others are not. For example:

- Identical. Maintenance and planned events.
- Slightly different. Forced events are a combination of the four definitions.
- New terms. Resource unavailable and turbine hours.

Some may say that resource unavailable is the same as the GADS cause codes for lack of fuel (wind). It does the same purpose but there is a special reason for not calling it a cause code.

In the dispatchable unit world, GADS collects data on each generating unit individually. In 2009, we collected data on more than 5,800 dispatchable generating units. In wind, we do not collect data on each wind turbine. There are about 30,000 WTG in operation now; about 180,000 WTG by 2020. To collect data on each WTG is impossible and not cost effective. For that reason, WTWG concluded that collecting data on groups of WTG is more practical and can provide the wanted results for all users. As a result, a new approach to data collection was invented and new terms using IEEE 762 were created:

- Turbine-hours (TH). Turbine-Hours are equal to the number of turbines in the group or sub-group times the number of Calendar Hours in the period. TH for any given condition for a given sub-group is equal to the total number of Calendar Hours that each wind turbine (WTG) in the sub-group spent in the given condition.

All of the following time/condition classifications are considered to be in turbine-hours.

- For example, the number of TH for a group of 12 WTG in January (with 744 hours in January) would be 12 x 744 or 8,928 TH.
- If one of those turbines were mothballed, the Period Turbine-Hours (PTH) would be 11 x 744 or 8,184 PTH with 744 Inactive Turbine-Hours.
- Resource Unavailable Turbine-Hours (RUTH). RUTH is the number of turbine-hours the turbines within a sub-group is not producing electricity due to the wind too low or too high or was outside manufacturer's operating specifications. For example, if 10 turbines stopped generating because of wind conditions for 3 hours each, RUTH would equal 30 turbine hours. RUTH is classified as Available Turbine-Hours for equipment calculations and Unavailable Turbine-Hours for site calculations.

There are more examples in Appendix C of the differences and similarities between the WTWG work and IEEE 762.

### **The Big Question.**

But the question is: is the WTWG work different enough to be different or is so similar to IEEE 762 that there is no need for IEEE guidance. It is hoped that IEEE Reliability Risk and Probability Applications Subcommittee (RRPA) can provide guidance in assisting NERC with its new wind data collection activity.

## Possible Recommendations from RRP

There are several actions that the RRP can take with regards to the proposed wind data collection proposal:

1. Nothing. In such case, the RRP feels that the wind data collection proposal can be handled by NERC if it sees proper. The IEEE 762 can be used by NERC as a basis for the work with the modifications it is using. Perhaps at some future time, the IEEE RRP can review it again and determine if more action is needed.
2. Recommended Practice option. From the IEEE Instructions on the Project Authorization Request (PAR) form, Recommended Practices are documents in which procedures and positions preferred by the IEEE are presented. Recommended practices are generally characterized by the use of the verb "should."
3. Guides. From the IEEE Instructions on the Project Authorization Request (PAR) form, Guides are documents in which alternative approaches to good practice are suggested, but no clear-cut recommendations are made. Guides are generally categorized by the use of the verb "may."
4. Modify IEEE 762 to include wind information. From the IEEE Style Manual at [http://standards.ieee.org/guides/style/2009\\_Style\\_Manual.pdf](http://standards.ieee.org/guides/style/2009_Style_Manual.pdf), there are several ways of changing a published standard:
  - a) Amendment. This is a document that contains new material to be incorporated into an existing IEEE standard and that may contain technical corrections to that standard as well. (This would possibly be applicable the case for the wind proposal.)
  - b) Corrigendum. This is a document that contains only technical corrections to an existing IEEE standard. (This would not be applicable the case for the wind proposal.)
  - c) Erratum. This is a document that corrects errors introduced to an approved standard during the publication process. Errata changes are not balloted documents and are always available for free on the IEEE-SA Web site. Developers and users of IEEE standards are encouraged to regularly consult the IEEE-SA Web site for any issued errata at: <http://standards.ieee.org/reading/ieee/updates/errata/index.html>. For information on issuing an errata contact an IEEE Standards project editor. (This would not be applicable the case for the wind proposal.)

### **More on amendments and corrigenda**

Amendments and corrigenda are balloted documents that give explicit instructions on how to change the text in an existing base standard or an existing amendment. The requirements for amendments and corrigenda are the same as for standards. However, these documents also contain editing instructions for each change. The editing instructions are important because the user should understand how the changes affect the base standard and because these documents are incorporated into the base standard sometime in the future.

### **Guidance from RRP Needed**

Assuming that NERC will require mandatory reporting (highly expected), then NERC will need standards to collect the data from the operating companies. For dispatchable units, NERC has the IEEE 762; there is nothing for wind. NERC staff asks that the RRP review this paper and provide discussion at the July 27, 2010 RRP meeting as to the best way to provide data collection terms and definitions for wind.

## Appendix A

### Wind Turbine Working Group

Larry Barr Chair of the UWIG Turbine O&M User Group	enXco 17298 Commerce Way Tracy, California 95377	(209) 836-1921 larryb@enxco.com
Fred Beasom Production Assurance Fleet Lead Time in Wind	FPL Energy 7021 Oak Creek Road Mojave, California 93501	(661) 824-8972 fred_beasom@ fpl.com
Valerie Beck Supervisor	California Public Utilities Commission 505 Van Ness Avenue 2nd Floor San Francisco, California 94102	(415) 703-5264 vjb@cpuc.ca.gov
Bill Beecher Data Analyst	AES Wind Generation, Inc.	(760) 329-6431 william.beecher@ aes.com
Roy Billinton Emeritus Professor	University of Saskatchewan College of Engineering Campus Drive Saskatoon, S7N 0W0	(306) 966-5399 (306) 966-5407 Fx roy.billinton@ usask.ca
George Bohn	Oklahoma Gas and Electric Co. P.O. Box 321, M/C C610 Oklahoma City, Oklahoma 73101	(405) 553-3204 bohng@oge.com
Merrill Brimhall	PacifiCorp 1407 West North Temple Street Salt Lake City, Utah 84140	(801) 220-2034 merrill.brimhall@ pacificorp.com
Ben Brinkman Utilities Engineer	California Public Utilities Commission 320 W. 4th Street Suite 500 Los Angeles, California 90013	(213) 576-7093 bdb@cpuc.ca.gov
Layne Brown Loads & Resources Senior Engineer	Western Electricity Coordinating Council 615 Arapeen Suite 210 Salt Lake City, Utah 84140	lbrown@wecc.biz
Sandy Butterfield Chief Engineer	National Renewable Energy Laboratory 1617 Cole Boulevard Golden , Colorado 80304	(303) 384-6902 sandy_butterfield@ nrel.gov
Ron Camp Tariff and Monthly Markets	ISO New England, Inc. One Sullivan Road Holyoke, Maine 01040	(413) 540-4518 rcamp@iso-ne.com

Bridget Carey Senior Advisor	Canadian Electricity Association 350 Sparks Street Suite 1100 Ottawa, Ontario K1R 7S8	(613) 688-2958 carey@ canelect.ca
Bruno Carlotti Senior Environmental Manager	Electricite de France 6 quai Watier Chatou, 78400	011-33-1-3087-7657 bruno.carlotti@ edf.fr
John W. Charlton Senior Analyst, Auxiliary Market Products	New York Independent System Operator 187 Wolf Road Albany, New York 12205	(518) 356-6047 jcharlton@ nyiso.com
Wing Cheng	Integ Enterprise Consulting, Inc. 38 East Park Street Newark, New Jersey 07102	(973) 642-2420 wcheng@ integconsulting.com
Thomas Christiansen Chief Operating Officer	Strategic Power Systems, Inc. 11121 Carmel Commons Blvd. Charlotte, North Carolina 28226	(704) 544-5501 (704) 544-5505 Fx christiansen@ spsinc.com
Mary J. Cooper Manager, Regulatory Reporting	First Wind 2 Shaw Alley, Suite 500 San Francisco, California 95762	(415) 671-4456 mjcooper@ firstwind.com
Christopher Cordes	Cordes Software 98 Maybrook Drive Maywood, New Jersey 07607	(201) 291-8640 ccordes@ cordessoftware.com
Billy Cutsor Resource Planning Engineer	Municipal Energy Agency of Nebraska 1111 O Street, Suite 200 P.O. Box 95124 Lincoln , Nebraska 68509	(402) 474-4759 (402) 474-0473 Fx bjcutsor@ nmpenergy.org
Enoch Davies Assistant Engineer	Western Electricity Coordinating Council 615 Arapeen Suite 210 Salt Lake City, Utah 84140	enoch@wecc.biz
Brad Davis Business Development	Cleanfield Energy 1404 Cormorant Road Unit #6 Ancaster, Ontario L9G 4V5	(905) 304-5223 bradd@ cleanfieldenergy.com
Sal DellaVilla CEO	Strategic Power Systems, Inc. 11121 Carmel Commons Boulevard Suite 100 Charlotte, North Carolina 28226	(704) 544-5501 (704) 554-5505 Fx sal.dellavilla@ spsinc.com
Timothy Donelon Operations Manager	TransCanada Power	(603) 638-2748 timothy_donelon@ transcanada.com

Kevin Dudney Energy Policy Analyst	California Public Utilities Commission 505 Van Ness Avenue 2nd Floor San Francisco, California 94102	(415) 703-2557 kd1@cpuc.ca.gov
John Dunlop Senior Technical Outreach Engineer	American Wind Energy Association 1101 14th Street, N.W. 12th Floor Washington, D.C. 20005	(612) 377-3270 jdunlop@awea.org
Sean Faulds Hydro Planner	Brookfield Power Corporation 480, de la Cite Boulevard Suite 200 Gatineau, Quebec J8T 8R3	(819) 561-2722 sean.faulds@ brookfieldpower.com
Ronald M. Fluegge Project Manager	Solomon Associates Two Galleria Tower Suite 1500 13455 Noel Road Dallas, Texas 75240-6634	(972) 739-1791 ron.fluegge@ solomononline.com
Jon Fournier	ORTECH 2395 Speakman Drive Mississauga, Ontario L5K 1B3	(905) 979-6375 jfournier@ ortech.ca
Ben Givens O&M Manager	AEP Wind Energy 1423 CR 131 Trent, Texas 79561	(325) 862-0032 bmgivens@aep.com
Paul Grabowski Information Consultant	We Energies 333 W. Everett St, A460 Milwaukee, Wisconsin 53290-0001	(414) 221-3222 Paul.Grabowski@ we-energies.com
Rob Gramlich Policy Director	American Wind Energy Association 1101 14th Street, N.W. 12th Floor Washington, D.C. 20005	(202) 383-2521 rgamlich@ awea.org
Rick Halet Principal Engineer	Xcel Energy, Inc. 414 Nicollet Mall Minneapolis, Minnesota 55401	(612) 330-7780 richard.m.halet@ xcelenergy.com
Adeeb Hamzey Engineer II	Dominion Resources Services 5000 Dominion Boulevard Glen Allen, Virginia 23060	(804) 273-4559 adeeb.hamzey@ dom.com
Bill Henson Renewable Energy Resource Integration	ISO New England, Inc. One Sullivan Road Holyoke, Massachusetts 01040	(413) 540-4716 whenson@ iso-ne.com
Roger Hill	Sandia National Laboratories P.O. Box 5800 Albuquerque, New Mexico 87185	(505) 844-6111 rrhill@ sandia.gov

Winnie Ho Utilities Engineer	California Public Utilities Commission 505 Van Ness Avenue 2nd Floor San Francisco, California 94102	who@cpuc.ca.gov
Dave Hurd Canadian Wind Operations Group	Brookfield Power Corporation 480, de la Cite Boulevard Suite 200 Gatineau, Quebec J8T 8R3	dave.hurd@ brookfieldpower.com
Mike Jacobs Deputy Policy Director	American Wind Energy Association 86 Prairie Street Concord, Massachusetts 01742	(978) 852-4674 mjacobs@awea.org
Shasta Kadonaga Senior Project Engineer	TransAlta Wind 110-12th Avenue, S.W. Calgary, Alberta T2P 2M1	(403) 267-2068 skadonaga@ visionquestwind.com
Ben Karlson	Sandia National Laboratories P.O. Box 5800 Albuquerque, New Mexico 87185	(505) 803-3676 bkarlso@ sandia.gov
Mark Kennedy Customer Interface and Data Analysis	Siemens Power Generation, Inc. 4400 Alafaya Trail, MC Q2-091 Orlando, Florida 32826	(407) 736-2475 mark.t.kennedy@ siemens.com
Brendan Kirby Consultant	American Wind Energy Association 2307 Laurel Lake Road Knoxville, Tennessee 37932	(865) 250-0753 kirbybj@ieee.org
Rao Konidena Lead Resource Forecasting	Midwest ISO, Inc. 1125 Energy Park Drive St. Paul, Minnesota 55113	(651) 632-8401 (651) 632-8417 Fx rkonidena@ midwestiso.org
David Le	California ISO 151 Blue Ravine Road Folsom, California 95630	(916) 608-7302 dle@caisoc.om
Bill Leighty Director	The Leighty Foundation P.O. Box 20993 Juneau, Alaska 99802	(907) 586-1426 wleighty@ earthlink.net
Haitao Liao Assistant Professor	University of Tennessee (The) Department of Nuclear Engineering Knoxville, Tennessee 37996-2300	(865) 974-0984 hliao4@utk.edu
Bonnie Lind Manager, Operations Analysis and Reporting	First Wind 340 Brannan St. Suite 302 San Francisco, California 94105	(415) 777-2820 blind@ upcwind.com
Davey C. Lopez Regulatory & Economic Studies	Midwest ISO, Inc.	(317) 249-5109 dlopez@ midwestiso.org

Gary McCarty Manager, Wind Production	PacifiCorp 610 Antler Casper, Wyoming 82601	(307) 399.2751 Gary.McCarty@ Pacifcorp.com
Bridget McKenney Wind Reliability & Analysis Database Lead	Sandia National Laboratories P.O. Box 5800 Albuquerque, New Mexico 87185	(505) 844-1235 blmcken@ sandia.gov
Daryl Metz	California Energy Commission 1516 Ninth Street MS23 Sacramento, California 95814	(916) 654-4760 dmetz@ energy.state.ca.us
Douglas C. Mollet Director, Wind Operations	PacifiCorp 1407 West North Temple Street Salt Lake City, Utah 84140	(801) 220-4803 douglas.mollet@ pacifcorp.com
Randall L. Oye Transmission Access Analyst	Xcel Energy, Inc. 250 Marquette Plaza Suite 720 Minneapolis, Minnesota 55401	(612) 330-2886 randall.l.oye@ xcelenergy.com
David Pomian Senior Engineer	PJM Interconnection, L.L.C. 955 Jefferson Avenue Valley Forge Corporate Center Norristown, Pennsylvania 19403-2497	(610) 666-4306 pomiad@pjm.com
Patrick Quinlan Director, Wind Systems Business Development	Second Wind Inc. 366 Summer Street Somerville, Massachusetts 02144	(617) 776-8520 Ext. 21 patrick@ secondwind.com
Douglas D. Reed Staff Engineer	Dominion Resources Services 5000 Dominion Boulevard Glen Allen, Virginia 23060	(804) 273-2435 Douglas.Reed@ dom.com
Paul Ressler	942 North 240 East American Fork, Utah 84003	(801) 692-0507 (801) 847-6528 Fx paul@ paulressler.com
Michelle Rodriguez	OGE Energy Corp.	rodrigmc@oge.com
Uwe Roeper President	ORTECH 2395 Speakman Drive Mississauga, Ontario L5K 1B3	(905) 822-4120 uroeper@ ortech.ca
Ray E. Rowen Generation M & O Technician	Lincoln Electric System 11th & O Streets P.O. Box 80869 Lincoln, Nebraska 68501-0869	(402) 420-8182 rrowen@les.com
Bob Ruhlman	Navigant Consulting, Inc. 2954 Orchard Drive Clarksville, Georgia 30523	(706) 754-0957 rruhlman@ navigantconsulting.com



Chuck Sanders	XEnergy Inc. 414 Nicollet Mall Minneapolis, Minnesota 55401	(612) 330-7780 charles.c.saunders@ xcelenergy.com
Gary A. Schuck Senior Engineer, Capacity Adequacy Planning Dept.	PJM Interconnection, L.L.C. 955 Jefferson Avenue Valley Forge Corporate Center Norristown, Pennsylvania 19403	(610) 666-4652 (610) 666-4282 Fx schucg1@pjm.com
Scott Sealing Electronic Quality and Reliability Engineer	General Electric 1 River Road Schenectady, New York 12345	(518) 385-7297 sealing@ge.com
Bob Sherwin		vtwindpower@ gmail.com
J. Charles Smith Executive Director	Utility Wind Integration Group 2004 Lakebreeze Way Reston, Virginia 20191	(703) 860-5160 (703) 860-1544 Fx jcharlessmith@ comcast.net
Lyrae Stage OCC/Data Manager	enXco 729 21st Street Operations Control Center Chandler, Minnesota 56122	(507) 677-2369 lyraes@enxco.com
Elizabeth Stoltzfus Public Utilities Regulatory Analyst	Canadian Electricity Association 505 Van Ness Avenue 2nd Floor San Francisco, California 94102	(415) 703-5586
Kedian Taborn Project Engineer	Strategic Power Systems, Inc.	(704) 945-4629 kedian.taborn@ spsinc.com
Lana Tran Regulatory Analyst	California Public Utilities Commission 505 Van Ness Avenue, 2nd Floor Electric Generation Performance Branch San Francisco, California 94102	(415) 703-5327 ltt@cpuc.ca.gov
Rick Tse Utilities Engineer	California Public Utilities Commission 505 Van Ness Avenue 2nd Floor San Francisco, California 94102	(415) 355-5581 rkt@cpuc.ca.gov
Melissa Valgardson	TransAlta Wind 110 - 12th Avenue, S.W. Calgary, Alberta T2P 2M1	melissa_valgardson@ transalta.com
Paul Veers Senior Technical Staff Member	Sandia National Laboratories Wind Energy Technology Department P.O. Box 5800, MS-1124 Albuquerque, New Mexico 87185	(505) 844-5522 psveers@ sandia.gov

	Lawrence W. Venner	enXco 17298 Commerce Way Tracy, California 95377	(209) 836-1921 larryv@enxco.com
	Sunitha Vijay Lead Reliability Engineer	General Electric 1 River Road Building 40-G40 Schenectady, New York 12345	(518) 385-4571 sunitha.vijay@ge.com
	Jerry Weber	Midwest Generation 440 S. LaSalle Street Suite 3500 Chicago, Illinois 60605	(312) 583-6078 jweber@mwgen.com
	Brad Whitlock Director	Navigant Consulting, Inc. P.O. Box 33996 Granada Hills, California 91394	(818) 368-6847 bwhitlock@navigantconsulting.com
	Steve Wotruba Project Manager	Energy Northwest P.O. Box 968 Richland, Virginia 99354	(509) 377-2443 stwotruba@energy-northwest.com
	Yi Zhang Regional Transmission - South	California ISO 151 Blue Ravine Road Folsom, California 95630	(916) 608-5734 yzhang@caiso.com
	Songzhe Zhu	California ISO 151 Blue Ravine Road Folsom, California 95630	(916) 608-5854 szhu@caiso.com
	Jana Zwiesler	Westar Energy 818 South Kansas Avenue P.O. Box 889 Topeka, Kansas 66601	(785) 575-8288 Jana.L.Zwiesler@westarenergy.com
<b>NERC Staff</b>	Jessica J Bian Director of Readiness Evaluation and Benchmarking	North American Electric Reliability Corporation 116-390 Village Boulevard Princeton, New Jersey 08540-5721	(609) 452-8060 (609) 452-9550 Fx jessica.bian@nerc.net
<b>NERC Staff</b>	Robert W. Cummings Director of Event Analysis & Information Exchange	North American Electric Reliability Corporation 116-390 Village Boulevard Princeton, New Jersey 08540-5721	(609) 452-8060 (609) 452-9550 Fx bob.cummings@nerc.net
<b>NERC Coordinator</b>	G. Michael Curley Manager of GADS Services	North American Electric Reliability Corporation 116-390 Village Boulevard Princeton, New Jersey 08540-5721	(609) 452-8060 (609) 452-9550 Fx michael.curley@nerc.net
<b>NERC Staff</b>	Mark G. Lauby Director of Reliability Assessment and Performance Analysis	North American Electric Reliability Corporation 116-390 Village Boulevard Princeton, New Jersey 08540-5721	(609) 452-8060 (609) 452-9550 Fx mark.lauby@nerc.net

**NERC Staff**

Joanne M. Rura  
GADS Services Coordinator

North American Electric Reliability  
Corporation  
116-390 Village Boulevard  
Princeton, New Jersey 08540-5721

(609) 452-8060  
(609) 452-9550 Fx  
joanne.rura@  
nerc.net

## **Appendix B**

### **Generating Availability Data System Task Force Scope**

#### ***Purpose***

The Generating Availability Data System (GADS) Task Force (TF) will review and recommend whether Generation Owners on the NERC Compliance Registry should report GADS data on a mandatory basis.

#### ***Background***

NERC began collecting and analyzing power plant outage information in 1982. Since its inception, GADS has collected more than 11 million outage records used for benchmarking existing unit performance and support of bulk power system reliability. More than 5,300 generating units report to GADS annually. GADS data collection and assessment provides the basis for much of North America's development of probabilistic resource adequacy assessments.

Data submittal to GADS<sup>1</sup> is currently voluntary and most (77%), but not all, North American electric generating owners provide data.

#### ***Activities***

To accomplish its purpose, the GADSTF will perform the following activities:

1. Review GADS and determine what data currently collected by GADS is needed to support and improve Bulk Power System (BPS) reliability.
2. Determine if collection of the data identified above should be mandatory by Generation Owners on the NERC Compliance Registry to support bulk power system reliability.
3. If GADS was made mandatory, recommend whether a Section 1600 data request should be used or a new standard should be developed.
4. Define data access to individual GADS unit data.

The GADSTF will target provision of its recommendations to the Planning Committee at its December 2010 meeting.

#### ***Membership***

The GADSTF members will be comprised of one Generation Owner and one Resource Planner from each region (16 members in total). A NERC staff member will be assigned as the secretary.

#### ***Governance***

The GADSTF will report to the Resource Issues Subcommittee of the NERC Planning Committee.

#### ***Meetings***

Face-to-face meetings will be held as needed. Conference calls and Web meetings will be used to address focused topics.

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<sup>1</sup> GADS data gathering definitions are based on the IEEE Standard 762, "Definitions for Reporting Electric Generating Unit Reliability, Availability and Productivity."

*Approved by the Planning Committee on June 16, 2010.*

**Appendix C**  
**Examples of Similarities and Differences**  
**IEEE 762 and WTWG Work**

<b>Terms</b>	<b>From IEEE 762</b>	<b>From GADS Wind</b>	<b>Notes</b>
Number of generators and revenue meters per unit	Under the conventional unit definition, there is one generator and one revenue meter per unit.	A group of WTG makes up a sub-group that makes up a group that is measured by a revenue meter. There may be 1 or 100 WT generators in one group to 1 revenue meter.	Different Approach
measurements of time	IEEE uses clock hours and MWh	WTG uses turbine-hours which equal the number of WTG time the number of clock hours.	Different Approach
Forced events (FO) (U1, U2, U3, SF)	4 types of FO	1 type of FO, a combination of the 4 types in 762. Combined with FO.	same definitions
Forced deratings (D1, D2, D3)	Defined as IEEE 762	Combined with FO events	
Maintenance (MO)	Defined as IEEE 762	same as IEEE 762	same definitions
Maintenance Deratings (D4)	Defined as IEEE 762	Combined with MO events	
MO Extentions	Defined as IEEE 762	No defined by WTWG	Extensions may be captured but is there a need?
Planned (PO)	Defined as IEEE 762	same as IEEE 762	same definitions
Planned deratings (PD)	Defined as IEEE 762	Combined with PO events	
PO Extentions	Defined as IEEE 762	No defined by WTWG	Extensions may be captured but is there a need?
Service hours	Defined in IEEE	Wind uses the term "contact hours" with the same definition as service hours.	
Reserve shutdown	Defined as IEEE 762	same as IEEE 762	same definitions
Resource Unavailable	No defined in 762	too low/too high winds	Unique to renewables
Actual unit starts	Defined as IEEE 762	No defined by WTWG	Since WTG are looked at as subgroups and groups of turbines, there was no good way to collect this number or reason to do so.

Attempted unit starts	Defined as IEEE 762	No defined by WTWG	Since WTG are looked at as subgroups and groups of turbines, there was no good way to collect this number or reason to do so.
Inactive reserve	Defined as IEEE 762	same as IEEE 762	same definitions
mothballed	Defined as IEEE 762	same as IEEE 762	same definitions
retired	Defined as IEEE 762	same as IEEE 762	same definitions