Phase IV Individual Filter Effluent Turbidity Performance

The Presidents Award recognizes treatment plants that have achieved the highest possible levels of individual filter effluent turbidity performance (Phase IV goals). Utilities that are considering pursuing Presidents Award recognition must understand that they will be assessed against very stringent performance goals. The Presidents Award represents a much higher performance level over Phase III of the Partnership. Participation at the Presidents Award level of the Partnership for Safe Water program is voluntary and is not required for continuing membership in Phase III of the Partnership program. However, a treatment plant must be a Phase III Directors Award plant in good standing to apply for the Presidents Award in Water Treatment.

The Presidents Award provides recognition to those plants that:

Demonstrate that they are achieving high levels of performance by meeting or bettering the Partnership for Safe Water Phase IV Individual Filter Effluent Turbidity Performance Goals for a 12-month period ending no more than two months prior to the application date. The Phase IV Individual Filter Effluent Turbidity Performance Goals are listed in Table 1 (shown in red).

<table>
<thead>
<tr>
<th>Table 1 - Partnership for Safe Water Phase IV Individual Filter Effluent Turbidity Performance Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ Individual filter effluent turbidity of less than 0.10 NTU 95 percent of the time based on values recorded at 15-minute time intervals (or more frequently)</td>
</tr>
<tr>
<td>➢ Maximum filtered water turbidity goal equal to or less than 0.30 NTU for all sample locations</td>
</tr>
<tr>
<td>➢ The treatment plant has an individual filter effluent turbidity goal following a backwash of no more than 15 minutes of water production at a turbidity equal to or greater than 0.10 NTU</td>
</tr>
</tbody>
</table>

All treatment plants seeking Presidents Award recognition for individual filter effluent turbidity performance are well positioned to reach the highest level of Partnership recognition, awarded to treatment plants for demonstrating fully optimized treatment – the “Excellence in Water Treatment Award.” The Excellence in Water Treatment Award application guidelines, available on the Partnership for Safe Water website, detail the additional requirements associated with achieving the program’s highest level of performance and recognition. The Phase IV individual filter effluent turbidity performance goals are among these requirements.
The Partnership for Safe Water offers two achievement levels beyond the Directors Award. These include: (1) Presidents Award and, (2) Excellence in Water Treatment Award. The Excellence in Water Treatment Award requirements include the steps needed to achieve the Presidents Award. The Presidents Award is intended to be a significant step for plants seeking the Excellence in Water Treatment Award. However achievement of the Presidents Award is not required prior to applying for Excellence in Water Treatment Award recognition. Plants pursuing recognition for either award must register their intent to apply for the award with AWWA’s Partnership staff. The registration process signifies the plant’s intentions to implement improvements identified during or after the self-assessment process using a collaborative team approach to attain fully optimized plant performance.

For the Presidents Award, the performance goals in Table 1 are based on all turbidity values from individual filters at 15-minute intervals (or more frequent) when the filters are in production. This is a significant change from Phase III where 4-hour data from combined filter effluent was used to evaluate plant performance. This means that utilities meeting the Partnership’s performance goals in Phase III may not achieve the Presidents Award level of performance. In working with the program’s optimization goals, the Partnership for Safe Water would like those utilities participating in this phase to understand the following position statement regarding the use of numerical performance goals by the Partnership program.

**POSITION STATEMENT ON NUMERICAL GOALS (approved April 19, 2010)**

The numerical goals used in the Partnership provide a basis from which optimization is discussed by the optimization review team. It is possible to be on either side of a particular numerical goal and be considered either optimized or not optimized, depending on the particular situation. Operational limits are used as guidelines only, and are interpreted by optimization review team members to assess performance status.

The numerical goals used in the Partnership in no way imply “best practices” or represent a standard of operational practice. Rather, these goals were selected for use in the Partnership program without requiring health-based risk analysis or cost/benefit evaluation. They serve instead as high-level goals towards which operators can strive in a process of continuous improvement. Establishment of performance goals is a key to successful performance improvement.

Any interpretation or use of the Partnership process and its imbedded numerical goals outside the Partnership process, and particularly in the regulatory process, is inappropriate, and in no way carries the endorsement, either explicit or implied, of the Partnership.

**POSITION ON USE OF REFERENCE MATERIALS (approved April 19, 2010)**

Use by the Partnership of reference materials (e.g. Self-Assessment Guide for Surface Water Treatment Plant Optimization or Water Research Foundation “Criteria for Optimized Distribution Systems”) is necessary to provide the resources and tools to support its processes. The Partnership neither explicitly nor implicitly endorses the contents of these materials beyond the use to support the Partnership processes.
Overall Approach
Applicants must register (www.awwa.org/partnership) their intent to pursue Presidents Award recognition. This is free and is intended to provide an opportunity for the Partnership for Safe Water Program Manager to contact the plant representative to verify the requirements for the Presidents and Excellence in Water Treatment Awards. This is intended to provide support, to answer questions, and give some assurance that the utility is ready to proceed through the Presidents Award application process.

After completion and submittal of this application (Appendix A checklist items) the package undergoes a technical examination by Partnership for Safe Water Program Manager. The Program Manager assesses the data to verify that it meets the individual filter effluent turbidity goals included in Table 1 and contains the additional report elements required for the Presidents Award.

If the Presidents Award application meets all the requirements, the Program Manager refers the application to PEAC-T Chair with a recommendation for award. Applications that do not satisfy the requirements for the Presidents Award are returned to the utility. Returned applications may be re-submitted when all of the requirements have been met.

The PEAC-T Chair reviews the application and considers the Program Manager recommendation for award. The PEAC-T Chair may conduct the review or enlist other PEAC-T members in the review. Applications that are determined not to meet the Presidents Award requirements are returned to the utility. Satisfactory applications are recommended to the Partnership’s Steering Committee (SC) to receive the Presidents Award.

The SC considers the recommendation and a vote is conducted to confer the award. The purpose of the SC review is to ensure consistency between reviews and to ensure that each Partnership organization (AWWA, AMWA, NAWC, ASDWA, USEPA, and WRF) agrees with the decision to confer the award. Once the SC has considered all of these issues and approved the recommendation, the utility is informed by the SC Chair that they will receive the Presidents Award for Water Treatment.
**General Requirements**

- Participation in the Partnership for Safe Water program at the Presidents Award level is voluntary and is not required for continuing membership in Phase III of the Partnership program.
- Prior to applying for Presidents Award recognition, the plant must have completed Phase III (received the Directors Award) and be a current Partnership subscriber in good standing, including payment of the current year’s subscription fees.
- Plant must complete the Presidents Award application process that includes all documents and data listed in the Presidents Award minimum reporting requirements checklist (Appendix A).
- The plant submits 12 months of individual filter effluent turbidity performance data as outlined in application package described below.
- The Partnership program provides no guarantee that the plant will receive Presidents Award recognition after completing the application process.
- Presidents Award-winning plants must submit annual reports (as described in Appendix B) to maintain Presidents Award status and be eligible to receive longevity awards.

**Presidents Award Application Package Requirements**

**Objective of the Application Package**
The documents, narrative discussion, and data submitted to comprise the Presidents Award application provide evidence that the treatment plant has met the award requirements.

Organize the Phase IV Presidents Award application package using the Document Check List (Appendix A). Electronic submission of the application is required.

**Plant Performance Contents of Application Package**

**Plant Turbidity Performance Data – Raw and Combined Filter Effluent**
The major consideration for determining if a plant is eligible for Presidents Award recognition is if it is meeting the individual filter effluent turbidity performance goals displayed in Table 1.

Data for the plant’s *raw and combined filter effluent turbidity for the most recent 12-month period* must be submitted using the Partnership for Safe Water data collection spreadsheet software. The entire page (shown in Figure 1) that includes the table of monthly plant statistics must be provided (not just the saved file that is sent to AWWA for the annual report). The 95th percentile values for each month must satisfy the performance goals displayed in Table 1. Any monthly values that do not meet the goals must be accompanied by a narrative explanation that describes the circumstances and justifies why the plant should be considered eligible to receive Presidents Award recognition in spite of these results.
Figure 1 - Example Data Collection Software Output used for Raw and CFE Data Submission

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Yearly</th>
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<th>Feb-12</th>
<th>Mar-12</th>
<th>Apr-12</th>
<th>May-12</th>
<th>Jun-12</th>
<th>Jul-12</th>
<th>Aug-12</th>
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<th>Nov-12</th>
<th>Dec-12</th>
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<td>0.01</td>
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</tr>
</tbody>
</table>

Individual Filter Effluent Turbidity Performance and Goals

To receive Presidents Award recognition, the plant must adopt the goals in Table 1 that will minimize turbidity spikes immediately after a filter is placed into production, especially following backwash. The following performance goals from Table 1 are used to assess filter performance when the filter is brought back on line after backwash or when filter-to-waste is terminated:

- Maximum value goal anytime during any filter run of less than or equal to 0.30 NTU for all sample locations.
- The treatment plant has an individual filter effluent turbidity goal following a backwash of no more than 15 minutes of water production at a turbidity equal to or greater than 0.10 NTU.

Monthly Individual Filter Effluent Turbidity Statistics

Plants must report the performance of each individual filter for each month during the 12-month reporting period. Performance is based on turbidity values taken from each filter at 15-minute intervals, with the 95th percentile values calculated for each month. The plant will use its own computer programs to generate the report. The Presidents Award requirement is that
each individual filter’s monthly 95th percentile turbidity value shall be less than 0.10 NTU, based on data collected at 15-minute intervals (or more frequent).

The other turbidity performance statistics (96th-99th percentiles) are recommended to be calculated, but are not required to be submitted in the application package. These additional measures are used by utilities to quantify performance consistency and confirm a high level of plant control. These are examined as part of the Excellence in Water Treatment Award requirements.

The turbidity values used for this performance calculation must be at 15-minute intervals (or more frequent) for each filter for each month, when the filter is in production. The values must be discrete and not averages or other types of adjusted turbidity values. If a filter is in production for any portion of the month, it should be included in the 95th percentile calculations. If a filter is not in service for a particular month(s), this should be indicated in the application package.

**Figure 2 - Individual Filter Performance Statistics Example**

**Monthly Individual Filter Percentile Statistics**

<table>
<thead>
<tr>
<th>Filter ID</th>
<th>95th Percentile Turbidity (NTU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter 1</td>
<td>0.059</td>
</tr>
<tr>
<td>Filter 2</td>
<td>0.053</td>
</tr>
<tr>
<td>Filter 3</td>
<td>0.054</td>
</tr>
<tr>
<td>Filter 4</td>
<td>0.038</td>
</tr>
<tr>
<td>Filter 5</td>
<td>0.043</td>
</tr>
<tr>
<td>Filter 6</td>
<td>0.056</td>
</tr>
<tr>
<td>Filter 7</td>
<td>0.058</td>
</tr>
<tr>
<td>Filter 8</td>
<td>0.032</td>
</tr>
</tbody>
</table>

Presidents Award treatment plants typically operate individual filters to produce turbidity less than 0.10 NTU at all times. The Partnership understands that it is not always practical, however, to strictly demand this performance. The performance requirement is therefore established as individual filter effluent turbidity of less than 0.10 NTU for 95% of the measurements taken at 15-minute intervals when the filter is in production.

**Data Collection and Quality Control**

Conclusions about the performance of the plant and its component processes must be based on accurate and verifiable data. The plant must have documentation that describes how sample locations were chosen and include any data that demonstrates that the sample accurately represents the water quality being produced by the filters.

The plant must have documentation or similar information regarding the type of instruments that are being used to produce the data provided in the Presidents Award application. The documentation should also describe the frequency of calibration (and verification) and offer standard operating procedures regarding the removal of data due to instrument malfunction.
The transfer of data from the instrumentation to the SCADA system should be described, along with any procedures used to process data to create the monthly individual filter 95th percentile data tables submitted with the Presidents Award application. Please note that data submitted shall not be averages but must be discrete data points.

The completed Instrumentation and Data Summary Form, included in Appendix C, may be submitted to fulfill the Data Collection and Quality Control information requirement to apply for the Presidents Award. The information may also be submitted using a brief narrative statement drafted by the utility.

 Presidents Award Annual Reporting Requirements

After receiving the Presidents Award, the utility will submit performance data annually to renew their award status and become eligible to receive the Partnership’s longevity awards. Submit individual filter turbidity performance data summaries for the most recent 12-month annual reporting period (typically June 1 – May 31) as described in the Application guidelines, along with 12 months of raw water, settled water (optional), and combined filter effluent turbidity data.

A written narrative report should examine plant performance trends and verify that performance (meeting the Phase IV individual filter effluent turbidity performance goals) has been maintained. Explain any finished water turbidity values that exceed these goals and what steps have been taken to prevent these occurrences in the future. In the narrative report, describe optimization activities that have taken place during the reporting period and describe optimization activities that are planned for the following year. State that the plant has not received a notice of violation since the last annual report. If the plant received a notice of violation, send a copy and explain the circumstances.

A complete Presidents Award annual data submission will also satisfy the requirements for the plant’s Directors Award annual submission. There is no need to submit a separate annual report to maintain the plant’s Directors Award status.

At a minimum, the annual report must include:

1. A signed copy of the Appendix B checklist with declarations indicated. This checklist includes a statement that the utility has not received a notice of violation for any applicable regulation (or a copy of any violation and an explanation of the circumstances).
2. Plant raw water, settled water (optional), and combined filter effluent turbidity results for the most recent 12-month reporting period (typically June 1 – May 31) using the Partnership data collection software.
3. Individual filter effluent turbidity monthly 95th percentile statistics tables, as indicated in the Presidents Award application guidelines, for the most recent 12-month annual reporting period (typically June 1 – May 31).
4. A narrative (comprised of three parts and limited to one or two pages) that describes (1) the optimization progress that was made on improvement projects identified in the self-
assessment or previous annual report; (2) optimization improvement projects that will be implemented in the following year; (3) and a performance evaluation of the individual filter effluent (IFE) results and the plant performance overall during the reporting period. This narrative should conclude with a short explanation of why this plant should continue to maintain its status as one of the best run plants in the field and receive a one-year renewal of Presidents Award status.

All Presidents award application and annual report materials must be transmitted in electronic format, unless otherwise arrange with the Partnership for Safe Water Program Manager.

For Further Information on Applying for the Presidents Award, contact:

Partnership Coordinator
Partnership for Safe Water
American Water Works Assoc.
6666 W. Quincy Ave.
Denver, CO 80235
Phone: (303) 347-6169
FAX: (303) 794-6303
e-mail: partnership@awwa.org
Appendix A
Partnership for Safe Water

Presidents Award Application Checklist

Minimum Requirements

The requirements listed below are the minimum for Presidents Award recognition. The burden is on the plant to provide adequate information for the review. Incomplete or unsatisfactory applications will be returned. Include a completed and signed copy (electronically) of this checklist with your application. All application materials must be transmitted electronically.

- Cover letter that includes contact information and plant identification. All applicants must be Directors Award plants in good standing with the Partnership for Safe Water. The cover letter should also include the population served by the plant, a description of the geographic area served by the plant, and a brief description of the plant’s treatment process train.
- Raw water and combined filter effluent turbidity results for the 12-month period ending no more than two months prior to the application date (must use current Partnership for Safe Water data collection software, EXCEL format). Provide data summary page including statistics table and trend graphs (Figure 1).
- Individual filter effluent turbidity summaries - monthly and annual 95 percentile values (based on 15 minute values) for each filter for the most recent 12-month period ending no more than two months prior to the application date. Format shown in Figure 2 above is acceptable.
- Data Collection and Quality Control information - Submission of the form included in Appendix C is recommended. This information may, as an alternative, be submitted in a narrative format.

Declarations

- The treatment plant has not received a notice of violation for any applicable regulations during the data reporting period. (If the plant received a notice of violation a copy is included along with a description of the circumstances).
- The treatment plant intends to continue to make performance improvements using a collaborative team approach to ultimately attain fully optimized plant performance (as indicated by the Excellence in Water Treatment Award).
- The treatment plant has a maximum individual filter turbidity goal value anytime during any filter run of less than or equal to 0.30 NTU for all sample locations.
- The treatment plant has an individual filter effluent turbidity goal following a backwash of no more than 15 minutes of water production at a turbidity equal to or greater than 0.10 NTU.
I confirm and attest to the above:

Authorized signature/Print Name

Send this information electronically to:
Partnership Coordinator, Partnership for Safe Water,
American Water Works Association, 6666 W. Quincy Ave., Denver, CO 80235
Phone: (303) 347-6169, e-mail: partnership@awwa.org
# Appendix B

## Partnership for Safe Water

### Presidents Award

**Annual Reporting Requirements Checklist**

For Annual Reporting, be sure to collect data that is needed to apply for the Presidents Award. This includes raw, combined filter effluent, and individual filter effluent turbidity performance data as described in the application guidelines. The Partnership’s reporting year typically runs from June 1 through May 31 of the following year. **Include a completed and signed copy (electronically) of this checklist with your application. All application materials must be transmitted electronically. A completed Presidents Award annual submission also fulfills the plant’s Directors Award reporting requirements.**

- **□** Cover letter (electronic format) including contact information, and plant identification. Award-winning plants must be in good standing with the *Partnership for Safe Water*.
- **□** Raw water, settled water (recommended for Directors Award annual reporting), and combined filter effluent turbidity results for the most recent 12-month reporting period, typically June 1 – May 31 (must use current *Partnership for Safe Water* data collection software, EXCEL format).
- **□** Individual filter effluent turbidity monthly and annual 95th percentile values for each filter for the most recent 12-month reporting period (typically June 1 – May 31).
- **□** Narrative report that describes the optimization activities conducted over the year (make sure to comment on items planned for in the previous annual report), a schedule or plan for the following year, and a review of the plant performance compared to the previous year.

### Declarations

- **□** The treatment plant has not received a notice of violation for any applicable regulations during the data reporting period. (If the plant received a notice of violation a copy is included along with a description of the circumstances).
- **□** The treatment plant intends to continue to make performance improvements using a collaborative team approach to ultimately attain fully optimized plant performance (as indicated by the *Excellence in Water Treatment Award*).
- **□** The treatment plant has a maximum individual filter turbidity goal value anytime during any filter run of less than or equal to 0.30 NTU for all sample locations.
- **□** The treatment plant has an individual filter effluent turbidity goal following a backwash of no more than 15 minutes of water production at a turbidity equal to or greater than 0.10 NTU.
I confirm and attest to the above:

________________________________________
Authorized signature/Print name

Send this information electronically to:
Partnership Coordinator, Partnership for Safe Water,
American Water Works Association, 6666 W. Quincy Ave., Denver, CO 80235
Phone: (303) 347-6169, e-mail: partnership@awwa.org
Appendix C

Partnership Presidents Award individual filter effluent turbidity evaluation checklist

Turbidimeters on-line for each filter? YES ____ NO ____

Number of turbidimeters in use on filters ________________________________

Turbidimeter Make (example: Hach, GLI, etc): ________________________________

Turbidimeter Model (example: 1720D, etc) ________________________________
   Note: List all types of turbidimeters in use on filters

Tapping location relative to filter effluent valve: BEFORE ____ or AFTER ____
   or OTHER (describe)_________________________

Tapping location relative to sampling of filter to waste stream: DOES ____ or DOESN’T ____
   SAMPLE Filter-To-Waste

Tap sampling location on pipe:  Vertical _____________
   Diagonal-up _____________
   Diagonal-down _____________
   Horizontal _____________
   Bottom _____________

Turbidimeters close to sample tap: YES ____ or NO ____
   If NO, explain: ________________________________

Turbidimeter Calibration with: Formazine ____ or USEPA approved pre-mixed ____

Turbidimeter Calibration Frequency at least quarterly: YES ____ or NO ____
   If NO, explain ________________________________

Turbidimeter verification according to manufacturer’s recommended method: Yes ____ or NO ____

Turbidimeter verification frequency at least monthly: YES ____ or NO ____
   If NO, explain ________________________________

IFE turbidity value reported based upon:
   Bubble reject mode: enabled ____ or disabled ____
   Signal average (seconds): 6 ____ or 30 ____ or 60 ____ or OTHER __________________________
   Print frequency (minutes): ________________________________

Data transmitted via:
   Signal Output module (SOM) YES ____ or NO ____
   SCADA: YES ____ or NO ____ (describe: ____________________________)
   Other Software: YES ____ or NO ____ (describe: ____________________________)
   Stripchart: YES ____ or NO ____
Data transfer to Spreadsheet via:
   Manual entry: YES ____ or NO ____
   Direct link with SCADA: YES ____ or NO ____
   Direct link with signal output module: YES ____ or NO ____
   Direct link with other software: YES ____ or NO ____
   Other: _______________________________

If SCADA used, describe SCADA polling interval: IN SECONDS ____ or IN MINUTES ____
   If frequency in minutes, then how many? _______________________________

Describe the data manipulation, if any, performed manually, or by the signal output module, SCADA, or other software prior to placing a value into final percentile spreadsheet: (examples: delta saving, double delta saving, etc)

Describe how often “print frequency” data is collected for use in the spreadsheet: (example: data is “printed” by turbidimeter every 1 minute, continuously scanned by SCADA within seconds polling interval, and placed into a SCADA file using real time values every scan, this file is then used by a program to grab data from this file every 15 minutes, this data selection is initiated at 00:01 hours and continues every 15 minutes thereafter. This “15 minute data” are transferred via a direct link software to excel, where it is written to floppy disk and then copied to final spreadsheet for percentile determination.):

Did the final submitted percentile calculations include the following 15 minute data values?

   First data value after a wash: YES ____ or NO ____
   Data values during a wash: YES ____ or NO ____
   Data values during documented maintenance activities: YES ____ or NO ____

Does your utility do the following:
   Assign one person to track IFE turbidity values on a monthly basis? YES ____ or NO ____
   Document time interval post backwash peak is above 0.10 NTU? YES ____ or NO ____
   Document all maintenance (calibrations, verifications, flushing) related turbidity spikes? YES ____ or NO ____

Other information: _______________________________

Thank-you for taking the time to complete this form, accurate answers will allow the Partnership Committee reviewing your report to understand the relationship of your submitted data to optimization.