

OFFICE OF INFORMATION AND TECHNOLOGY
NATIONAL DATA CENTER PROGRAM

DCCI Management Metrics

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Executive Summary

The National Data Center Program (NDCP) collects specific Key Performance Indicator (KPI) data about Department of Veterans Affairs (VA) datacenter facilities. This information is used by Enterprise Operations (EO) to manage the Agency's datacenter enterprise through transformation and modernization efforts, and to report Agency progress on Federal datacenter management initiatives.

Scope

This instruction applies to all Department of Veterans Affairs (VA) datacenters and facilities that physically contain those datacenters. The official list of VA datacenters is determined by reporting requirements of the Federal Data Center Consolidation Initiative (FDCCI).

VA datacenter reporting requirements are a matrix requirement where the datacenters are not operated/managed by Enterprise Operations (EO). Reporting of these metrics out of organizational silos (for example, from Field Operations (FO) datacenters to NDGP) is mandated by the NDGP DCCI Program Charter.

Purpose

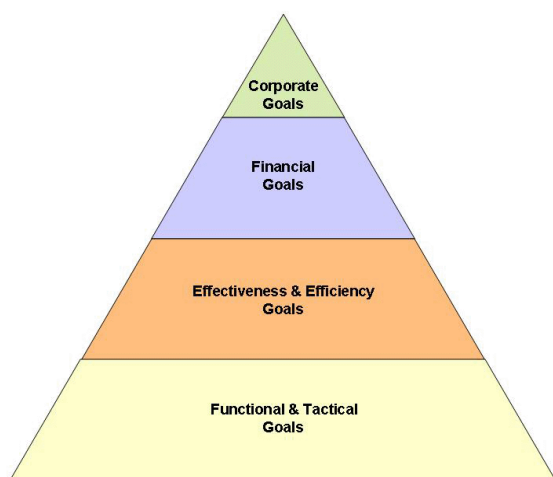
"You cannot manage what you do not measure."

The National Data Center Program (NDGP) and NDGP's Data Center Consolidation Initiative (DCCI) are chartered to transform and modernize the Agency's datacenter enterprise to meet a broad set of requirements under FDCCI. The purposes of the metrics in this instruction are for NDGP to be able to effectively manage the DCCI program, to show progress towards meeting FDCCI and Agency goals, and to enable accurate FDCCI data reporting to the Office of Management & Budget (OMB).

Background

Metrics allow measurement and analysis of key performance indicators (KPIs) that show change over time in the parameters that are derived as most important in meeting Agency business goals. Goals

require time-based change from one situation to another, more optimal one. Metrics are valuable in the context of change over the lifecycle of a project or program; one-time measurements do not provide contextual information that maps to the achievement of a goal.



Agency business goals are driven from high-end corporate mission and purpose statements, and are hierarchically aligned as shown in the goal pyramid. There are four (4) levels of Agency business goals, each level being derived from the higher level:

1. Corporate Goals.
2. Financial Goals.
3. Effectiveness & Efficiency Goals.
4. Functional & Tactical Goals.

Higher-level goals are strategic; that is, they relate most directly to the purpose and mission of the Agency (http://www.va.gov/about_va/mission.asp). Lower-level goals are primarily tactical and represent how the Agency plans to achieve specific requirements and to implement specific Agency core values.

The intent for the DCCI metrics described in this instruction is to allow NDCP make appropriate and effective decisions to allow attainment of Agency tactical (functional, effectiveness, & efficiency) business goals and to assist in achievement of Agency strategic (financial) goals.

The NDCP DCCI program has an expected lifecycle of ten (10) years. The metrics in this instruction are designed to show process trends over the entire program lifecycle. Results showing enterprise-wide progress towards Agency goals are anticipated to take years, not months, to obtain an adequate amount of data to produce accurate statistical information. Acceptable levels of deficiencies are allowable and expected, and create a baseline for improvement of processes and teams; without the deficiencies, there would be no need for goals or the programs to reach those goals.

Specific metrics are anticipated to change over time to reflect changes in FDCCI reporting requirements and definitions, potentially requiring re-baselining of some data.

DCCI Metrics

VA is primarily interested in two (2) key metrics areas that will show DCCI programmatic success: Facility Infrastructure and Operational Costs. Each metric area has a subset of individual data requirements that must be reported by all enterprise datacenters.

- Facility Infrastructure Metrics (Size, Tier, Capacities, Redundancy, Efficiency, Availability)
 - Datacenter Square Footage
 - Facility Total Electrical Consumption, MWh
 - IT Equipment Load Total Electrical Consumption, MWh
 - UPS Load Total Electrical Consumption, MWh
 - Datacenter Physical Infrastructure Total Electrical Consumption, MWh
 - Renewable Energy Usage, MWh
 - UPS Capacity, kW
 - Generator Capacity, kVA
 - Chiller Capacity, tons
 - PUE (*calculated metric*)
 - SIEER (*calculated metric*)
 - Availability (*to be implemented in the future*)
- Operational Cost Metrics (Lease, O&M, Utilities)
 - Facility Lease Cost
 - Datacenter % Facility Floorspace
 - Non-Lease Facility Maintenance Cost
 - Non-Lease Facility Utility Cost
 - Estimate of Maintenance Costs (where rolled into lease cost)
 - Estimate of Utility Costs (where rolled into lease cost)
 - Datacenter Lease Cost Portion (*calculated metric*)
 - Datacenter Maintenance Cost Portion (*calculated metric*)
 - Datacenter Utility Cost Portion (*calculated metric*)
 - Estimated Datacenter Facility Cost (*calculated metric*)

FDCCI Reporting Requirements

In addition, DCCI will collect FDCCI-specific reporting metrics for datacenters designated as Core Data Centers (CDCs). FDCCI's reporting structure and cost savings projection model depend heavily on costs per operating system and virtualized operating system.

- Application & IT Equipment Inventory Metrics (Servers, Bandwidth, Storage)
 - Rack Count
 - # of Physical Servers (single OS, not virtual hosts)
 - Mainframes (IBM or compatible)
 - Mainframes (other)
 - Windows Servers
 - Unix Servers
 - Linux Servers
 - HPC Cluster Nodes
 - Other Servers
 - # of Virtual Host Servers
 - Total Virtual Host Count (counted separately from single OS physical servers)
 - Total Virtual OS Count
 - Storage Capacity, TB
 - Total Storage Available (SAN, NAS, DAS, Tape, et cetera), TB
 - Total Storage Used (SAN, NAS, DAS, Tape, et cetera), TB
 - # of Enterprise Applications Supported
 - # of Local Applications Supported
 - Average Servers/Rack (*calculated metric*)
 - Total Physical Servers (*calculated metric*)

- Total Supported OSs *(calculated metric)*
 - OS Virtualization Percentage *(calculated metric)*
 - Storage Usage Percentage *(calculated metric)*
- Staffing Support Metrics (FTEs, Labor Costs)
 - # Direct/Onsite Facility Support Staff (FTE equivalents)
 - # Outsourced Facility Maintenance Staff (FTE equivalents)
 - Direct Facility Support Staff Cost
 - Total Datacenter Operating Cost *(calculated metric)*
 - Cost per OS per Hour (COSH) *(calculated metric)*

Metrics Data Collection Methodology

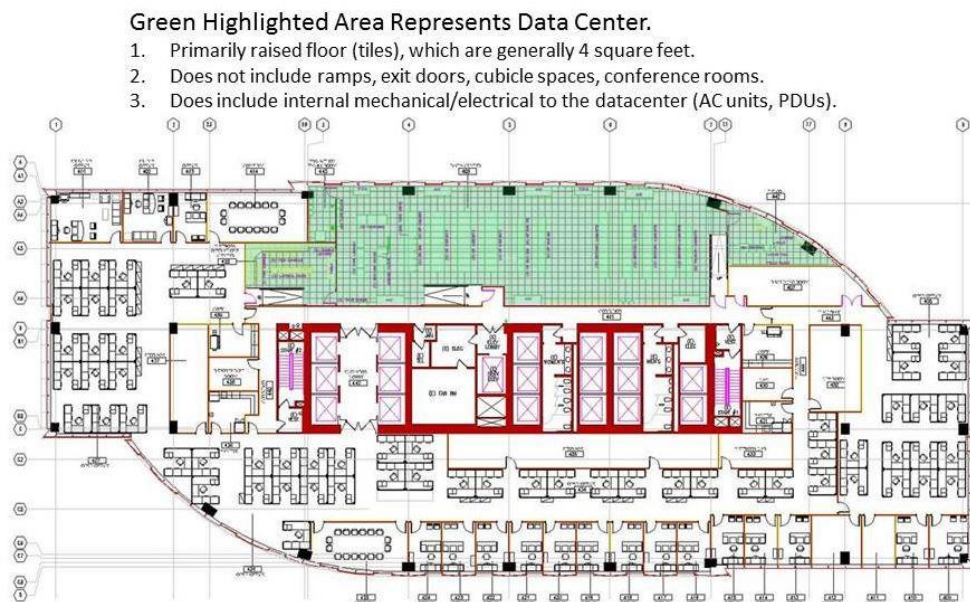
For VA DCCI metrics reporting purposes, energy metrics and ratios are collected, reported, and calculated using an energy (MWh) basis rather than a power (W or volt-amp) basis.

For VA DCCI metrics calculation purposes, there are 730 hours in a standard month (8,760/12) and 30.4167 days in a standard month (8,760/24).

I. Facility Infrastructure (Size, Tier, Capacities, Redundancy, Efficiency, Availability) Metrics.

1. **Datacenter Square Footage.** This number, in square feet, is what is commonly referred to as “raised floor space.” Provide the sum of the square footages of all “raised floor space” in the reporting facility that is used for or available for IT equipment. Do not include office/administrative space, mechanical/electrical rooms, storage areas, or other spaces (even if collocated in the raised floor datacenter space). This number is anticipated to, in general, be relatively static over time except for when new datacenter space is added or datacenter space is decommissioned and transferred to another use/purpose.

Example:



2. **Facility Total Electrical Consumption, MWh.** This number, in megawatt-hours, is the total amount of electricity consumed by the building housing the datacenter over the calendar month reporting period.

This metric requires totaling the (a) amount of electrical energy going into the building through the building’s main step-down transformer(s) and (b) the amount of electrical energy generated through running any facility or datacenter generator equipment.

Total electrical energy from the local utility (a) is metered by the local utility company. This portion of the metric can be obtained from the utility electrical bill, or can be calculated if local resources have capabilities to read the electrical meter(s) directly.

Generator power (b) is estimated by the number of hours that the generator plant(s) run times the power capacity of those generators. The time that the generators run includes building (live) load tests where the building (or some portion thereof) is supported by the generator plant, but does not include offline generator tests and maintenance.

*Example: Facility X receives its July power bill from the utility company. The bill indicates that 1,450,000kWh of electricity were billed for the month of July. The building also conducted its biannual live load tests of its emergency generator plant in July. The building was on generator for 12 hours. The total generator plant capacity is 750kW. The facility total electrical consumption for the month is therefore $(1,450,000\text{kWh} / 1,000 =) 1,450\text{MWh}$ of commercial and $(12\text{hours} * 750\text{kW} / 1,000 =) 9\text{MWh}$ of generator, for a total consumption of 1,459MWh.*

3. **IT Equipment Load Total Electrical Consumption, MWh.** This number, in megawatt-hours, is the total amount of electricity consumed by the IT equipment on the datacenter “raised floor” over the calendar month reporting period.

There are multiple ways to obtain this data, depending on the equipment that is installed in the datacenter. Use the most accurate method (methods are described from most to least accurate) to gather the metric information.

- a. If power distribution equipment (PDUs) in the datacenter have branch level metering, or if modular power distribution units (MPDUs) in the racks have rack-level power monitoring, whether this is connected to a facility building automation system (BAS)/energy management control system (EMCS) or not, collect actual energy use data at the level closest to the IT equipment. Use of a BAS/EMCS to automatically collect & calculate this information provides the most accurate measurement. It is beyond the scope of this instruction to detail how to perform adequate collection and correct calculation of ‘actual’ IT equipment electrical consumption.
- b. If PDUs in the facility have the capability to record kWh that they supply (and most modern units do), perform a manual (or automated, if BAS/EMCS capabilities are available) recording of the kWh reading on the PDU at a specified time for each reporting period (e.g., calendar month). For example, collect kWh numbers for all PDUs supporting the datacenter at 9am on the first calendar day of the month, and summate the change in kWh numbers from the previous period reading.
- c. Datacenters generally have dedicated uninterruptible power supply (UPS) systems to ensure IT equipment power is continuously available. At a specified time for each reporting period (e.g., calendar month), collect kWh numbers for all UPS systems supporting the datacenter and summate the change in kWh numbers from the previous period reading.
- d. For non-dedicated datacenters and facilities where UPS systems also support non-datacenter administrative functions, follow the guidance for UPS kWh reporting in (c) above, and use a documented, realistic engineering estimate of the percentage of the UPS system power that is supplied to the datacenter IT equipment. This engineering estimate could involve counting the approximate number of amp-hours used by servers in the datacenter and the approximate number of amp-hours that are used in a UPS-backed administrative

space, and determining the ratio (3:1, or 75%, for example). Use this estimated ratio (75%, in our example) times the change in kWh numbers from the previous period reading to report the metric.

- e. Where the datacenter does not have any of the previous metering equipment to assist in developing the metric, provide a realistic engineering estimate of IT equipment power use by another method. Consult with the Data Center Facilities & Connectivity team under Data Center Operations (DCO), Enterprise Operations (EO) as necessary and document the process that will be used at the facility. An example of how to estimate a monthly total IT electrical consumption is to use a clamp-on electrical meter on the input power cables to a dedicated electrical distribution circuit panel, determine the amperage being provided during an assumed representative time period, multiply the amperage by the panel voltage, divide by 1.73 for three-phase distribution, and convert from power-basis to energy basis by multiplying by 730 (average hours per month). Other methods may be more appropriate given the equipment in and configuration of a particular datacenter facility.

4. **UPS Load Total Electrical Consumption, MWh.** This number, in megawatt-hours, is the total amount of electricity consumed by all equipment downstream of the facility UPS system(s) over the calendar month reporting period.

Datacenters generally have dedicated uninterruptible power supply (UPS) systems to ensure IT equipment power is continuously available. At a specified time for each reporting period (e.g., calendar month), collect kWh numbers for all UPS systems and summate the change in kWh numbers from the previous period reading.

At a specified time for each reporting period (e.g., calendar month), collect kWh numbers for all UPS systems supporting the datacenter and summate the change in kWh numbers from the previous period reading. *For example, last month's kWh reading on UPS 1 was 220,000 and this month's reading is 235,000. Last month's kWh reading on UPS 2 was 350,000 and this month's reading is 375,000. The UPS electrical consumption for the month is (235,000-220,000 + 375,000-350,000 =) 40,000kWh. Report 40MWh.*

5. **Datacenter Physical Infrastructure Total Electrical Consumption, MWh.** This number, in megawatt-hours, measures the total amount of electricity needed to run physical infrastructure (mechanical and electrical support) necessary to operate the datacenter over the calendar month reporting period. The metric includes the amount of energy needed to operate power supply/distribution equipment (transformers, switchgear, meters, UPSs and PDUs, wiring to the IT devices), heating/cooling equipment (chillers, pumps, cooling towers, CRAC units), lighting in the datacenter, physical security systems in the datacenter (access control, intrusion detection, surveillance), fire protection and similar systems and system electrical losses (through transmission, conversion, et cetera). This metric is necessary to calculate Power Usage Efficiency (PUE).

Explanatory: VA facilities generally have shared/ integrated physical plants (mechanical & electrical rooms) that provide support to both datacenter and non-datacenter (administrative, patient care, et cetera) spaces. Separate metering of the portion(s) of physical plants that solely provide support to the datacenter is not expected to be available because of the mixed use and legacy nature of VA facilities. There are no simple, standardized methods of obtaining this information in the shared/integrated physical infrastructure environments typical in VA facilities.

In order to obtain this information, VA uses a measure/estimate methodology. The input power to each of the devices that support the datacenter is measured (see method (e) in metric “*IT Equipment Load Total Electrical Consumption, MWh*” above) and converted from power-basis to energy-basis by multiplying by 730 (average hours per month). For each device, this will yield an estimate of the monthly energy usage of the device – *for example, 1,460MWh per month for a shared chiller measured at 2,000kW (2,000kW * 730hours / 1,000 = 1,460MWh).*

The fraction of the load of the device supporting the datacenter will then be estimated, and this fraction multiplied with the monthly energy usage of the device. This fraction is an engineering estimate of what percentage of the device’s load is used to support the datacenter (as opposed to supporting non-datacenter loads). *For example, based on how much chilled water flow goes to administrative office spaces versus to the datacenter (perhaps based on water pipe size), the site estimates that 65% of the chilled water goes to the datacenter. The energy consumed to support the datacenter for that chiller for the month is 1,460MWh * 0.65 = 949MWh.*

Individual sites are responsible for documenting the assumptions that they use to calculate and summate physical infrastructure electrical consumption. There are no standard templates for collecting, aggregating, or estimating this information because of the unique configuration of physical infrastructure systems at each VA facility. Consult with the Data Center Facilities & Connectivity team under Data Center Operations (DCO), Enterprise Operations (EO) as necessary and document the assumptions and process that will be used at the facility.

6. **Renewable Energy Usage, MWh.** This metric reports the amount of total consumed electricity (metric “*Facility Total Electrical Consumption, MWh*,” above) that is generated from renewable resources (including but not limited to solar, wind, hydro, and wave) over the calendar month reporting period. Electricity generated from hydrocarbon (coal, natural gas) and nuclear power plants is not considered renewable for the purposes of this indicator.

In accordance with [Presidential Memorandum 131205](#), “Federal Leadership on Energy Management,” [Executive Order 13423](#), “Strengthening Federal Environmental, Energy, and Transportation Management,” and [EPAct 2005 Section 203](#), VA has a current mandate of 7.5% (minimum) of consumed energy to be produced by renewable sources, and a future target of 20% (minimum) by 2020.

Example: Facility X’s total electrical consumption for August is 4,500MWh, all from the electric company. Facility X pays for 250MWh of electricity each month to be provided from wind farms. Facility X will report 250MWh (5.56%) renewable energy usage for August.

7. **UPS Capacity, kW.** Report the size of the UPS system supporting the datacenter (or the sum of the sizes of UPS systems in a multi-datacenter facility) in kW. UPS systems may not be dedicated to datacenter support and may provide electrical service to other mission-critical elements within the facility; for the purposes of this metric, report the total UPS capacity. Qualitative facility descriptions will capture how the facility UPS systems are configured in more detail.

Consult with the Data Center Facilities & Connectivity team under Data Center Operations (DCO), Enterprise Operations (EO) as necessary and document the assumptions that are used to report this metric.

- a. If the datacenter does not have and is not supported by a UPS system, report zero.
 - b. If the facility has a single UPS (non-redundant, single system) supporting a single datacenter, the size of that system is the kW rating of that UPS system. *For example, a single 350kW UPS supporting the datacenter would be reported as 350kW.*
 - c. If the facility has multiple UPS systems configured in a single bus (tied together), report the sum of UPS sizes on the bus. *For example, a facility has four (4) 350kW units tied together in a single bus. Report the UPS capacity as $(350kVA * 4 =) 1,400kW$.*
 - d. If the facility has multiple UPS systems configured in multiple busses (to support dedicated A and B busses) supporting the datacenter, report the sum of UPS sizes on the smaller bus. *For example, a facility has four (4) 350kW units on the A bus and two (2) 350kW units and two (2) 500kW units on the B bus. The smaller bus is A. Report the UPS capacity as $(350kVA * 4 =) 1,400kW$.*
 - e. If a facility has multiple datacenters supported by a single UPS system, follow the rules above treating the multiple datacenters as a single datacenter.
 - f. If a facility has multiple datacenters supported by multiple, independent UPS systems, complete separate calculations for each datacenter as noted above and add the resulting capacities for each datacenter together. Report the combined capacity number.
8. **Generator Capacity, kVA.** Report the size of the generator system supporting the datacenter (or the sum of the sizes of generator systems in a multi-datacenter facility) in kVA. Generator systems are generally not be dedicated to datacenter support and may provide electrical service to other mission-critical elements within the facility; for the purposes of this metric, report the total generator capacity. Qualitative facility descriptions will capture how the facility generator systems are configured and what facility equipment they support in more detail.

Explanatory: Generators are sometimes rated in kW rather than in kVA. To convert from kW to kVA, divide the kW rating by a power factor of 0.8. *For example, a 600kW generator set has a rated capacity of $600kW / 0.8 = 750kVA$. Report kVA rather than kW for this metric.*

Consult with the Data Center Facilities & Connectivity team under Data Center Operations (DCO), Enterprise Operations (EO) as necessary and document the assumptions that are used to report this metric.

- a. If the datacenter is not backed up by an automatic emergency power generation system, report zero.
- b. If the facility has a single generator, report the size in kVA of that generator. *For example, a 600kW generator set has a rated capacity of $600kW / 0.8 = 750kVA$. Report the generator capacity as 750kVA.*
- c. If the facility has multiple generators configured in a single bus (tied together), report the sum of generator sizes on the bus. *For example, a facility has four (4) 450kVA/360kW units tied together in a single bus. Report the generator capacity as $(450kVA * 4 =) 1,800kVA$.*
- d. If the facility has multiple generators configured in multiple busses (to support dedicated A and B busses or separate main utility feeds) supporting the datacenter, report the sum of generator sizes on the smaller bus. *For example, a facility has four (4) 450kVA/360kW units*

*on the A bus and two (2) 450kVA/360kW units and two (2) 750kVA/600kW units on the B bus. The smaller bus is A. Report the generator capacity as $(450\text{kVA} * 4 =) 1,800\text{kVA}$.*

- e. If a facility has multiple datacenters supported by a single generator system, follow the rules above treating the multiple datacenters as a single datacenter.
- f. If a facility has multiple datacenters supported by multiple, independent generator systems, complete separate calculations for each datacenter as noted above and add the resulting capacities for each datacenter together. Report the combined capacity number.

9. **Chiller Capacity, tons.** Report the size of the chiller (heat rejection) system supporting the datacenter (or the sum of the sizes of chiller systems in a multi-datacenter facility) in tons. Chiller systems may not be dedicated to datacenter support and may provide cooling service to other mission-critical elements within the facility; for the purposes of this metric, report the total chiller capacity. Qualitative facility descriptions will capture how the facility chiller systems are configured in more detail.

Explanatory: Chiller equipment capacity is typically measured in tons of cooling. One ton is equal to 3.5168525kW. A 100-ton chiller provides 351.68kW of cooling. The total amount of cooling required in the datacenter is approximately equal to the amount of IT equipment load.

Consult with the Data Center Facilities & Connectivity team under Data Center Operations (DCO), Enterprise Operations (EO) as necessary and document the assumptions that are used to report this metric.

Identify all of the chiller units that provide cooling to the datacenter. If a central physical plant provides some or all of this cooling, determine if it is configured as a single or redundant system.

- a. If all of the chillers providing cooling to the datacenter are independent or there is a single cooling system, add all of the tonnages of these chillers together and report this number.
*Example: The datacenter has four (4) 30-ton dedicated roof-mounted chillers and is also supported by a physical plant with two (2) 100-ton chillers configured as a single system. Report $(4 * 30\text{tons} + 2 * 100\text{tons} =) 320\text{ tons}$.*
- b. If some of the chillers providing cooling to the datacenter are in a redundant plant system, use the smaller of the two redundant system tonnages for the plant chiller capacity.
*Example: The datacenter has two (2) 20-ton dedicated roof-mounted chillers and is also supported by a physical plant with a redundant chiller system. The redundant system has two (2) 400-ton chillers on each side. Report $(2 * 20\text{tons} + 2 * 400\text{tons} =) 840\text{ tons}$.*
- c. If a facility has multiple datacenters supported by a single chiller system, follow the rules above treating the multiple datacenters as a single datacenter.
- d. If a facility has multiple datacenters supported by multiple, independent chiller systems, complete separate calculations for each datacenter as noted above and add the resulting capacities for each datacenter together. Report the combined capacity number.

10. **PUE (Power Usage Effectiveness).** This metric is defined as the total datacenter energy consumption divided by the *IT Equipment Load Total Electrical Consumption* for the reporting period. The total datacenter energy consumption is the sum of the *Datacenter Physical Infrastructure Total Electrical Consumption* and the *IT Equipment Load Total Electrical Consumption*. Report results to two (2) decimal points. **This metric is calculated from user inputs.**

For example, if the datacenter physical infrastructure total electrical consumption for the month is 1,600MWh and the IT Equipment Load Total Electrical Consumption is 1,200MWh, report $(2,800\text{MWh} / 1,200\text{MWh}) = 2.33$.

Because PUE will vary seasonally and with changes in user load, it cannot be accurately calculated and reported on an instantaneous basis. PUE is more accurate when averaged over a longer period, where no significant IT equipment or facility changes are made over that period. When PUE is reported up to FDCCI and VA management, a moving average of the most recent three (3) monthly PUE numbers for the facility will be used.

11. **SIEER (Site Infrastructure Energy Efficiency Rating).** This metric is defined as the *Facility Total Electrical Consumption* divided by the *UPS Load Total Electrical Consumption* for the reporting period. Report results to two (2) decimal points. **This metric is calculated from user inputs.**

For example, if the Facility Total Electrical Consumption for the month is 5,600MWh and the UPS Load Total Electrical Consumption is 1,200MWh, report $(5,600\text{MWh} / 1,200\text{MWh}) = 4.67$.

Because SIEER will vary seasonally and with changes in user load, it cannot be accurately calculated and reported on an instantaneous basis. SIEER is more accurate when averaged over

Why do we report two (2) energy efficiency metrics?

NDCP is frequently asked to provide PUE (Power Usage Effectiveness) information to determine the energy efficiency of our datacenters. PUE has been heavily marketed by industry sources as the most technically correct energy efficiency metric for datacenters. This assertion is technically correct, but obtaining all of the data necessary to accurately compute PUE for direct comparison with other datacenters requires a significant investment in electrical power metering and monitoring that is not a reasonable use of limited resources within the Agency.

Currently, VA generally only has metering at the UPS level, prior to any transformation and transmission losses to downstream IT equipment. The high costs and low return on investment to install the required additional metering and monitoring systems in hundreds of VA datacenters for accurate PUE reporting are incongruent.

PUE is calculated using only the actual energy used at the IT equipment, downstream of all transformers and transmission to the IT equipment locations, and only the actual energy used to provide facility infrastructure support (cooling and electrical transmission) for the datacenter environment (excluding any administrative and other non-datacenter loads). In order to measure the energy required for the PUE calculation, we would have to have complete PDU & RDC branch circuit monitoring implemented or meters installed at each IT rack, isolated physical plant infrastructure with complete metering, and the capability to record those electrical meters over time.

SIEER (Site Infrastructure Energy Efficiency Ratio) measures facility and datacenter efficiency differently, requires significantly less metering and monitoring equipment investment, allows VA flexibility in determining what is measured in shared-use (datacenter and administrative or hospital) facilities, and still provides information that shows efficiency improvements over time.

SIEER is defined as the total power coming into the facility divided by the total power being supported by the UPS system (technical power load, including the power necessary to operate the UPS and downstream power distribution equipment). While SIEER and PUE are similar efficiency metrics, they are not directly comparable.

a longer period, where no significant IT equipment or facility changes are made over that period.

12. **Availability (to be implemented in the future).** This metric is defined as the proportion of time that the facility physical infrastructure is available to support IT services. Data to calculate this metric is reported as the number of minutes that IT services were unavailable over the reporting period.

Site availability is defined from the IT service end-user perspective. Any site incident or event that affects information availability as experienced by the end user detracts from site infrastructure availability. The site downtime clock starts running from the moment IT operations were first affected until they are fully restored. Thus, site downtime is not the 15 seconds of a utility power failure, but the total time users were down until IT availability was restored. Downtime for site infrastructure maintenance (which includes time to bring IT systems down, perform maintenance, and restore IT availability) and downtime due to physical infrastructure equipment failures are both counted against site availability.

Application migration and consolidation activities are not included in calculations for this metric.

Compile all facility-related downtime for the reporting period that impacted end-user ability to access or utilize services hosted by or provided through the datacenter. Report the total amount of non-overlapping time, in minutes, that IT services were not available to end-users for the reporting period due to planned and unplanned facility maintenance, repair, and upgrade activities.

Example: At facility X in the month of November, there was a scheduled maintenance event that required IT equipment in the datacenter to be turned off for 30 minutes. The total amount of time the services provided by that equipment were not available was 60 minutes, including shutdown and restarting. There was also a chilled water pump failure that required IT equipment to be shut down while repairs were made, which took 90 minutes from the time the IT equipment was turned off until it was restarted and available to the end-user again. Report (60 + 90 =) 150 minutes of downtime for the reporting period.

Availability is compiled on a fiscal year basis. There are different availability goals based on the echelon level of the reporting datacenter.

II. Operational Cost (Lease, O&M, Utilities) Metrics.

1. **Facility Lease Cost.** This metric is the total annual lease cost that VA pays for the facility, including all included services (e.g. utilities & maintenance, if applicable) and amortized tenant improvements. This facility cost is for the entire building, campus, or VA-occupied portion of the building, not just for the datacenter.

If the facility is VA-owned, report zero.

Lease periods do not typically converge directly with calendar or fiscal years. Report the annual lease cost for the facility for the majority of the reporting month. *For example, if the year 1 lease cost for facility X is \$500,000, the year 2 lease cost is \$510,000, and the lease period*

changes on 20 June, in May report \$500,000, in June report \$500,000, and in July report \$510,000. If the lease period evenly splits the month, report the later year's lease cost. For example, there are 30 days in June. If the lease period in the previous example began on 16 June (15 days of lease in the first half of the month and 15 days in the second half), in May report \$500,000 and in June report \$510,000.

2. **Datacenter % Facility Floorspace.** Report the total (gross) facility floorspace for the building, campus, or VA-occupied portion of the building. This number is the total enclosed, conditioned space used by VA, including shared or common spaces in multi-tenant facilities (i.e., restrooms, hallways, break rooms, and lobbies).

The metrics collection tool will automatically calculate the Datacenter % Facility Floorspace by dividing Datacenter Square Footage into the reported total (gross) facility floorspace reported here. *For example, Datacenter Square Footage at facility X was reported as 2,500 and the total (gross) facility floorspace is reported as 100,000. The metric will be $(2,500 / 100,000 =) 2.5\%$.*

3. **Non-Lease Facility Maintenance Cost.** Report the total monthly cost of facility sustainment, repair, and maintenance (SR&M) contracts outside of services provided through a lease agreement (if one exists). SR&M services include but are not limited to electrical and mechanical maintenance, custodial/janitorial, snow removal, recycling services, and similar services that keep the facility and facility physical infrastructure operating in a safe and effective manner.

Labor costs for maintenance personnel are generally rolled into service contract costs. Do not separate labor costs.

Report based on total annual contract Firm Fixed Price (FFP) costs, and major additional non-FFP costs for items such as equipment repair.

Security services (physical security, operation and/or maintenance of physical access and security systems, guards, et cetera) are not considered SR&M services for the purposes of this metric.

Where a lease includes 'normal' SR&M services (for example, on an 8x5 basis only) and there are additional costs for above-and-beyond SR&M services for 24x7 operations, report those additional SR&M costs here.

Example: Facility X has service contracts with ABC Electrical, DEF Mechanical, and Goodwill Services to provide comprehensive operations and maintenance services supporting the facility. The combined cost of these contracts for the year is \$250,000. In the reporting month a chiller required non-FFP repairs that will cost an additional \$10,000. Report $(\$250,000 / 12\text{months} + \$10,000 =) \$30,833$ for the calendar month reporting period.

4. **Non-Lease Facility Utility Cost.** Report the total monthly cost of utility services outside of services provided through a lease agreement (if one exists). Utilities generally include electricity, water, wastewater, sewer, gas, and trash removal. Recycling services are considered SR&M services for the purposes of this metric.

Where a lease includes ‘normal’ utility services (for example, on an 8x5 basis only) and there are additional costs for above-and-beyond utility services for 24x7 operations, report those additional utility costs here.

– At some sites we will not be able to isolate utilities costs from the lease/SLA; at some we may have “afterhours” utility costs outside of normal 8x5 GSA utility cost inclusion; and at others we may pay the actual lease costs

5. **Estimates of Maintenance Costs (where those costs are rolled into lease cost).** Report the estimated amount (a non-zero portion of the *Facility Lease Cost* above) that provides sustainment, repair, and maintenance (SR&M) services. SR&M services include but are not limited to electrical and mechanical maintenance, custodial/janitorial, snow removal, recycling services, and similar services that keep the facility and facility physical infrastructure operating in a safe and effective manner.

Security services (physical security, operation and/or maintenance of physical access and security systems, guards, et cetera) are not considered SR&M services for the purposes of this metric.

This information is typically available from the leasing office.

If the facility is VA-owned (no lease exists) and all maintenance costs are contracted, report zero. These maintenance costs are captured in *Non-Lease Maintenance Cost* above.

6. **Estimate of Utility Costs (where those costs are rolled into lease cost).** Report the estimated amount (a non-zero portion of the *Facility Lease Cost* above) that provides utility services to the facility. Utilities generally include electricity, water, wastewater, sewer, gas, and trash removal. Recycling services are considered SR&M services for the purposes of this metric.

This information is typically available from the leasing office.

If the facility is VA-owned (no lease exists) and all utility costs are paid directly to utility service provider(s), report zero. These utility costs are captured in *Non-Lease Utility Cost* above.

III. Application & IT Equipment Inventory (Servers, Bandwidth, Storage) Metrics.

1. **Rack Count.** This metric measures the number of physical racks and frames used to hold IT equipment including but not limited to servers, storage, switches, networking patch panels, and similar equipment.

Include empty racks located at the facility that are physically installed but not currently in use. Tape drive and similar storage devices that have a larger footprint than a standard IT equipment rack (i.e., silos) are counted as a single rack for the purposes of this metric.

In leased or shared facilities, include only the racks that are in the VA-occupied space or racks that hold IT equipment servicing VA.

2. **Number of Physical Servers (single OS, not virtual hosts).** These metrics measure the number of servers and similar IT processing equipment systems that have a single operating system (OS) running on them. Each individual blade server (not in a cluster node) is counted as a single server. Storage, encryption, switches, and similar pieces of IT equipment are not included in these metric numbers. Do not include physical servers that run multiple (virtualized) OSs in these metric numbers.

In leased or shared facilities, include only the servers that are in the VA-occupied space or that service VA.

Trending of these metrics is intended to show progress in virtualization in the enterprise as well as consolidation of applications and services from lower to higher echelon datacenters.

- a. Mainframes (IBM or compatible). Count the number of IBM or IBM-compatible mainframe servers. These devices are typically stand-alone rack-based pieces of equipment.
 - b. Mainframes (other). Count the number of non-IBM and non-IBM compatible mainframe servers. These devices are typically stand-alone rack-based pieces of equipment.
 - c. Windows Servers. Count the number of servers that run a single Windows OS.
 - d. Unix Servers. Count the number of servers that run a single Unix OS.
 - e. Linux Servers. Count the number of servers that run a single Linux OS.
 - f. HPC Cluster Nodes. Count the number of servers that run a single HPC (High Performance Computing) cluster. Each cluster is counted as a single node for the purposes of this metric.
 - g. Other Servers. Count the number of servers that run a single OS not included in the previous categories.
3. **Number of Virtual Host Servers.** These metrics measure the number of servers and similar IT processing equipment systems that have multiple operating systems (OSs) running on them. Each individual blade server (not in a cluster node) is counted as an individual server. Storage, encryption, switches, and similar pieces of IT equipment are not included in these metric numbers.

In leased or shared facilities, include only the servers that are in the VA-occupied space or that service VA. If no virtual host information is available for the leased or shared facility, assume that each virtual host hosts ten (10) virtual operating systems, rounding up to the nearest whole number of virtual host servers as necessary. *For example, if facility X is a commercial datacenter and runs 45 virtual OS instances for VA, assume that there are $(45 / 10 =) 4.5$ servers supporting VA. Round up from 4.5 to 5, the next higher whole number, and report 5 virtual host servers and 45 virtual OSs.*

Trending of these metrics is intended to show progress in virtualization in the enterprise as well as support for the 'Cloud First' mandate.

- a. **Total Virtual Host Count.** Count the number of servers that are used to host virtual operating systems. These virtual host servers are not included in the physical server count metric. *For example, facility X has 20 servers running single-instance Windows operating systems and five servers each running multiple (virtualized) Windows operating systems. Report five virtual hosts for this metric.*
 - b. **Total Virtual OS Count.** Count the number of virtual OSs that are located on all virtual host servers. Virtual host servers can host multiple virtual OSs. Virtual host servers can run one or more 'flavor' of operating system; do not differentiate between different operating system types when counting virtual OSs. *For example, facility X has 20 servers running single-instance Windows operating systems, three servers each running eight (virtualized) Windows operating systems, and two servers each running four (virtualized) Unix operating systems. Report $(3 * 8 + 2 * 4 =) 32$ virtual OSs for this metric.*
4. **Storage Capacity, TB.** Report the total (gross) amount of storage capability in terabytes (TB) from all dedicated storage devices installed and used in the facility supporting VA applications. In leased or shared facilities, only report the amount of storage that is available or used to support VA. Do not include storage on server hard drives, only that from dedicated storage devices.

Trending of these metrics is intended to show growth of the IT program and data storage requirements to support VA applications.

- a. **Total Storage Available (SAN, NAS, DAS, Tape, et cetera), TB.** Summate the total amount of storage, in terabytes, of all dedicated storage devices in the facility that support VA applications. For tape devices, summate the total capacity of all tapes in use, in storage, used to provide archive data, and unused tapes available for the same purposes.
 - b. **Total Storage Used (SAN, NAS, DAS, Tape, et cetera), TB.** Summate the total amount of storage, in terabytes, of all dedicated storage devices in the facility that support VA applications currently in use (holding VA data). Exclude unused hard drive space and unused tapes.
5. **# of Enterprise Applications Supported.** Count the number of applications (not instances of applications) from the list of defined "enterprise applications" that physical and virtualized servers in the facility support.

Enterprise applications are those that provide the same IT services to multiple end-user locations (e.g., VistA, Microsoft Exchange, and AutoDesk License Server).

Trending of this metric is intended to show movement of applications from lower to higher echelon datacenters through enterprise datacenter transformation to the target state.

6. **# of Local Applications Supported.** Count the number of applications (not instances of applications) from the list of defined “local applications” that physical and virtualized servers in the facility support. These applications are facility-specific and not separable from the local environment.

Local applications are those that provide facility-specific IT services to end-users at the local facility and cannot be consolidated because of operational or technical reasons. Examples of these applications might include local physical access control, Active Directory (providing local user login authentication, file sharing, and printer services), and applications that operate or interface with locally-installed medical devices.

Trending of this metric is intended to show what applications cannot be feasibly consolidated and that lower echelon datacenters providing these services must be maintained in the inventory to provide local IT support services.

IV. Staffing Support (FTEs) Metrics.

1. **# Direct/Onsite Facility Support Staff (FTE equivalents).** This metric counts the number of Full Time Equivalent (FTE) full-time employees provide direct onsite support necessary to operate, manage, and maintain the datacenter and supporting physical plant. Staff counting towards this metric include such personnel as the facility manager, facility engineer, and contracted full-time physical plant O&M personnel. The physical plant for the facility is considered inseparable from the physical plant for the datacenter for the purposes of this metric; that is, do not estimate or report partial FTEs because only a portion of the physical plant supports the datacenter.

FTEs generally have a 2,080 hour work schedule each year based on 40 hours each week for 52 weeks each year (less holidays, personal leave, and sick leave). Each FTE is counted as 1.0 FTEs if their work effort is dedicated to providing operations, management, and maintenance support to the datacenter and supporting physical plant. Report all support for the facility physical plant, not only for a portion that directly supports the datacenter.

If a staff member meeting the requirements of this metric has additional duties not involving the datacenter and supporting physical plant, count that staff member as a partial FTE based on an estimate of the fraction of 2,080 hours (less holidays, personal leave, and sick leave) spent supporting the datacenter and supporting physical plant. *For example, Sarah Bellum is responsible for physical security of the containing facility as well as facilities management for the datacenter and physical plant at facility X. She spends approximately 60% of her duty time supporting the datacenter and physical plant, and 40% of her duty time supporting physical security for the containing facility. Sarah would be reported as a 0.6 FTE for this metric.*

Staff members to be counted include both Government and Contractor staff. Contractor staff that are on full-time, 8x5 and 24x7 onsite support contracts are also counted in this metric. *For example, facility X has a mechanical services contract that has a technician onsite supporting the datacenter physical plant from 0700-1600 Monday through Friday. This technician is counted as a 1.0 FTE. Facility X also has an electrical services contract that provides an onsite technician 24 hours a day, 7 days a week to provide emergency repair services as well as to build power whips and monitor the electrical infrastructure. Because there are 168 hours in a calendar week and*

an FTE works 40 hours each week, these technicians would be counted as $(168 / 40 =) 4.2$ FTEs if there is no overlap in their schedules, or more likely 5 FTEs assuming a reasonable work schedule overlap. Report the actual number of FTEs that provide this direct support where possible.

Do not include IT, security, or custodial/janitorial staff (system or database administrators, help desk personnel, network operations personnel, facility physical security personnel, IT security personnel, janitors, et cetera) in this metric.

2. **# Outsourced Facility Maintenance Staff (FTE equivalents).** This metric counts the number of Full Time Equivalent (FTE) part-time employees provide direct onsite support necessary to operate, manage, and maintain the datacenter and supporting physical plant. Staff counting towards this metric include contracted part-time physical plant O&M personnel. (Full-time contracted staff are counted in # *Direct/Onsite Facility Support Staff* above).

Count these staff members as partial FTEs based on an estimate of the fraction of 2,080 hours (less holidays, personal leave, and sick leave) spent supporting the datacenter and supporting physical plant. *For example, Joe Mechanic is a technician for ABC Mechanical Systems contracted to provide weekly and monthly scheduled maintenance services in support of the datacenter and physical plant at facility X. Joe spends approximately 4 hours each week and 8 hours each month onsite performing these contracted maintenance functions. In a calendar year this would equal $(4 * 52 + 8 * 12 =) 304$ hours. Joe would be reported as a $(304 / 2080 =) 0.15$ FTE for this metric.*

3. **Direct Facility Support Staff Cost.** Provide the total FTE salary cost for the FTEs in # *Direct/Onsite Facility Support Staff* that provide direct facility operations and maintenance services for the datacenter and supporting physical plant. Exclude maintenance contract costs, as salary information for contractor service personnel cannot be easily nor reliably extracted from an FFP contract cost for services. Do not include these costs even if they are available. Estimate salary costs where specific data is not available.

This staff cost provides the Government FTE salary and locality pay for each Government FTE providing services described in # *Direct/Onsite Facility Support Staff*.

This staff cost provides the Contractor FTE salary information for each Contractor FTE providing services described in # *Direct/Onsite Facility Support Staff*, but excludes salary information for contractor staff operating on a facility maintenance contract (both 8x5 and 24x7). *For example, Steve King, a contractor providing facility management services, and Anne Oakley, a contractor that provides services under a maintenance contract for the physical plant, both support facility X. Report Steve's salary information only.*

If a staff member meeting the requirements of this metric has additional duties not involving the datacenter and supporting physical plant, count that staff member as a partial FTE based on an estimate of the fraction of 2,080 hours (less holidays, personal leave, and sick leave) spent supporting the datacenter and supporting physical plant. *For example, Steve's job includes approximately 60% IT support services and 40% datacenter facility management. Report 40% of Steve's salary information for this metric.*

V. Calculated Metrics.

1. **Datacenter Lease Cost Portion.** This metric is calculated as the product of the *Facility Lease Cost* for the entire facility and the *Datacenter % Facility Floorspace*. When the facility is VA-owned, this cost will be zero. This metric assumes that lease costs throughout the facility are proportional to square footage.
2. **Datacenter Maintenance Cost Portion.** This metric is calculated as the product of the *Datacenter % Facility Floorspace* and the sum of *Non-Lease Facility Maintenance Cost* and *Estimate of Maintenance Costs (where rolled into lease cost)*. This metric assumes that maintenance costs throughout the facility are proportional to square footage.
3. **Datacenter Utility Cost Portion.** This metric is calculated as the product of the percentage of the *IT Equipment Load Total Electrical Consumption* and *Datacenter Physical Infrastructure Total Electrical Consumption* compared to the *Facility Total Electrical Consumption* and the sum of *Non-Lease Facility Utility Cost* and *Estimate of Utility Costs (where rolled into lease cost)*. This metric uses collected datacenter electrical usage information rather than assuming that utility costs are proportional to square footage.
4. **Estimated Datacenter Facility Cost.** This metric is calculated as the sum of the *Datacenter Lease Cost Portion*, *Datacenter Maintenance Cost Portion*, and *Datacenter Utility Cost Portion*. The metric represents the cost of operating the datacenter without including IT or labor costs.
5. **Average Servers/Rack.** This metric is calculated as the total number of physical and virtual host servers divided by the total number of racks reported by the facility.
6. **Total Physical Servers.** This metric is calculated as the total number of physical and virtual host servers reported by the facility.
7. **Total Supported OSs.** This metric is calculated as the sum of the total number of physical servers (one OS per server) and the *Total Virtual OS Count*.
8. **OS Virtualization Percentage.** This metric is calculated as the *Total Virtual OS Count* divided by the *Total Supported OSs*.
9. **Storage Usage Percentage.** This metric is calculated as the *Total Storage Used* divided by the *Total Storage Available*.
10. **Total Datacenter Operating Cost.** This metric is calculated as the sum of the *Estimated Datacenter Facility Cost* and the *Direct Facility Support Staff Cost*. This metric assumes that the same level of direct facility labor would be required to operate the datacenter's physical plant if administrative and other facility functions were removed from the facility.
11. **Cost per OS per Hour (COSH).** This metric is calculated as the *Total Datacenter Operating Cost* divided by the *Total Supported OSs*, divided by a standard 730-hour month.

Metrics Reporting Requirements & Responsibilities

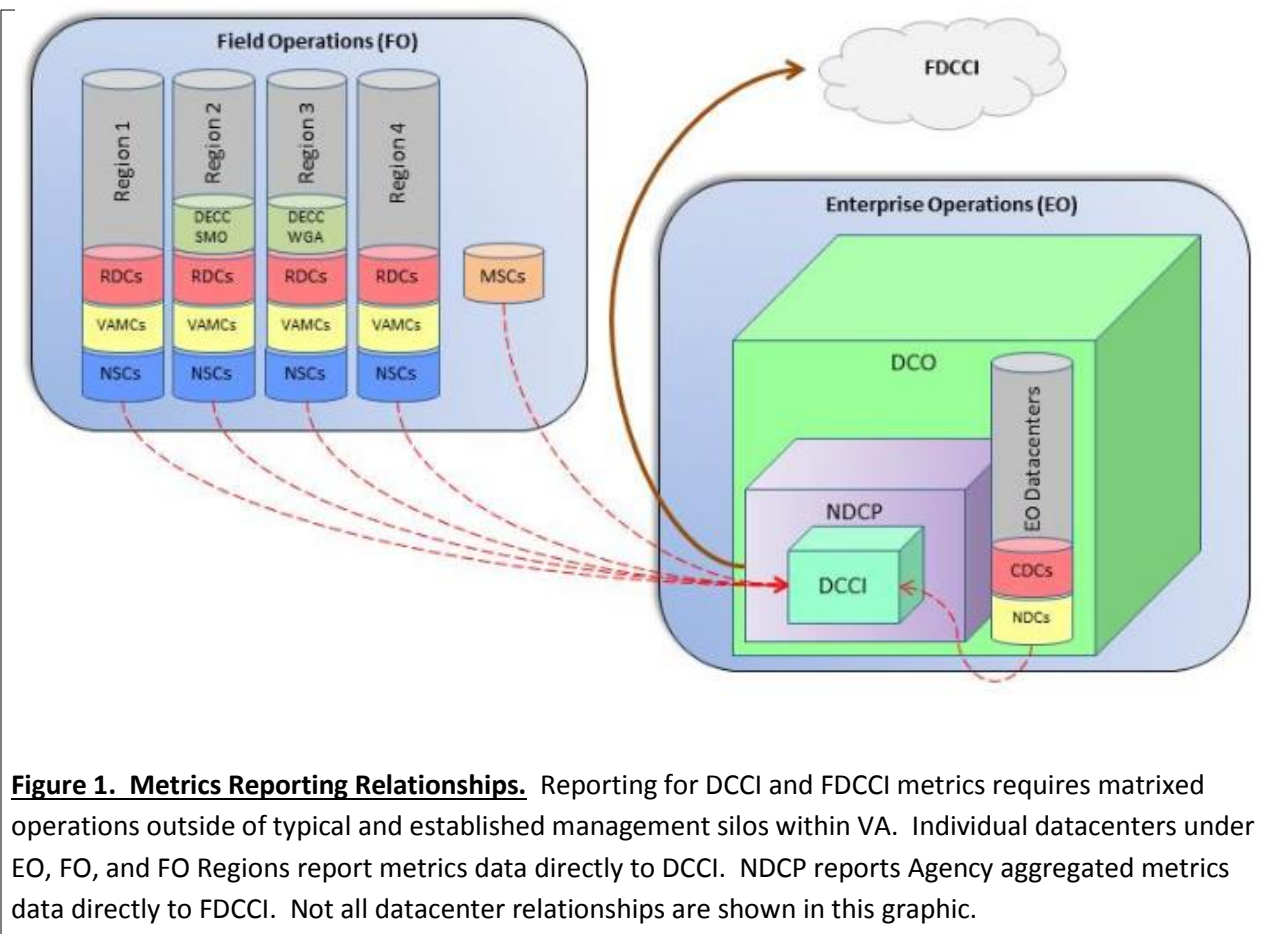
Specific Responsibilities:

Datacenter and Facility Directors: Responsible for ensuring current, accurate reporting individual information is provided to DCCI.

Facility Managers and Supervisors: Responsible for collecting metrics data from the local facility and submitting data to DCCI on the required schedule. Facility managers are responsible for maintaining a local copy of the facility's current lease agreement with lease period information, costs, and terms & conditions. Facility managers are responsible for maintaining a local copy of all maintenance service contracts that support the facility with costs and terms & conditions.

Data Center Facilities & Connectivity Team (DCO): Responsible for providing consistent guidance and direction to local site facility managers and supervisors regarding assumptions and data collection methodologies IAW this instruction.

DCCI Program Team (DCO): Responsible for maintaining metrics management records on all enterprise datacenters. Responsible for analyzing and reporting metrics to FDCCI through internal NDCCP (DCO) channels.



Collection Responsibilities:

Metrics data collection and reporting are the responsibility of the facility where the datacenter physically resides. Reporting is not conducted using VA data call procedures, but is rather a required periodic operations & maintenance (O&M) management responsibility conducted by the assigned local staff resource at the reporting facility.

The assigned local staff resource responsible for reporting shall be the datacenter facility manager, typically a GS-1640 or -0801 series individual.

Where a datacenter is located in a facility directly managed by another facility, a single assigned local staff resource may be responsible for both the parent and the child facility reporting requirements.

DCCI shall maintain a list of assigned local staff resources and their supervisors. Assigned local staff resources shall receive calendar reminders of reporting requirements to ensure local resources are scheduled to collect and report metrics on the VA-internal reporting schedule. Each local datacenter or facility director is responsible for ensuring their facility assigned local staffing resource information is current and accurate.

Current methodology – to be updated as web-based metrics reporting tool becomes available:

DCCI shall provide site metrics recording tools, including a standardized spreadsheet that shows individual datacenter metrics tabulated and graphic data. When metrics reporting requirements to FDCCI change, DCCI shall provide updated site metrics recording tools to individual datacenters.

Acronyms

| | |
|-------|--|
| BAS | Building Automation System |
| CDC | Core Data Center |
| CMMS | Computerized Maintenance Management System |
| DCCI | Data Center Consolidation Initiative |
| DCO | Data Center Operations (VA Organization) |
| DECC | Defense Enterprise Computing Center |
| EMCS | Energy Management Control System |
| EO | Enterprise Operations (VA Organization) |
| FDCCI | Federal Data Center Consolidation Initiative |
| FFP | Firm Fixed Price |
| FO | Field Operations (VA Organization) |
| FTE | Full Time Equivalent |
| GS | General Schedule |
| GSA | General Services Administration |
| HPC | High Performance Computing |
| IBM | International Business Machines |
| IT | Information Technology |
| KPI | Key Performance Indicator |
| kVA | Kilo-Volt/Amp |
| kW | Kilowatt |
| kWh | Kilowatt-Hour |
| MPDU | Modular Power Distribution Unit |
| MSC | Mission Support Center |
| MWh | Megawatt-Hour |
| NDCP | National Data Center Program (DCO Program) |
| NSC | Network Support Center |
| O&M | Operations & Maintenance |
| OIT | Office of Information & Technology (VA Organization) |
| OMB | Office of Management & Budget |
| OS | Operating System |
| PDU | Power Distribution Unit |
| PUE | Power Usage Effectiveness |
| RDC | Remote Distribution Cabinet |
| SIEER | Site Infrastructure Energy Efficiency Rating |
| SLA | Service Level Agreement |
| SR&M | Sustainment, Repair, & Maintenance |
| TB | Terabytes |
| UPS | Uninterruptible Power System |
| VA | Department of Veterans Affairs |
| VAMC | Veterans Affairs Medical Center |
| W | Watt |

Glossary

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|-----------------------------------|--|
| Application: | An application is a collection of servers (physical and/or virtual), operating systems, other specific software, and storage used to provide a specific business function. Applications are supported by IT infrastructure systems that may be shared or integral to the application. |
| Chiller System: | A chiller system is a collection of one or more heat rejection devices that removes excess heat from a heat source (typically a datacenter) and removes it to a heat sink (typically the external environment). In the context of this metrics instruction, the chiller system is all of the heat rejection devices, including but not limited to water-cooled chiller plants, direct-exchange (DX) air conditioners, and roof-top air conditioning units (RTUs) that provide cooling to a datacenter. |
| Core Data Center (CDC): | CDCs are centralized datacenters that provide enterprise-level and cloud services to geographically-distributed VA organizations and business functions. The CDC designation is made by NDCP. |
| Datacenter: | <p>A data center is a repository (closet, room, floor or building) for the storage, management, and dissemination of data and information. This repository houses computer systems and associated components, such as telecommunications and storage systems. It generally includes redundant or backup power supplies, redundant data communications connections, environmental controls (air conditioning, fire suppression, et cetera), and special security devices housed in leased, owned, collocated, or stand-alone facilities.</p> <p>In the context of modernization, an Agency data center is defined as any automated information processing and data storage operation that performs one or more of the following functions: processes Agency-approved automated applications systems, affords time-sharing services to Agency personnel, provides office automation and records management services through a centralized processor, and/or provides network management support for Agency wide area networks.</p> |
| Infrastructure System (IT Usage): | Infrastructure Systems are a collection of common elements which are necessary to support applications. Infrastructure systems consist of routers, switches, data communications cabling, storage hardware, security and monitoring hardware and software, DNS and DHCP equipment (both real and virtual), and similar. Infrastructure systems may be related to specific applications or to groups of applications. |

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|-------------------------------|---|
| Metrics: | Parameters or measures of quantitative assessment used for measurement, comparison or to track performance or production. Metrics are used to compare the performance of different entities and sets of entities, despite the many variations between those groups. |
| Mission Support Center (MSC): | MSCs are stand-alone datacenters that provide specific enterprise IT functionality to VA organizations and business functions. The MSC designation is made by NDCP. |
| Network Support Center (NSC): | NSCs are local datacenters that provide local IT application and network support to local operating locations. The NSC designation is made by NDCP. |
| System (IT Usage): | A system is a combination of an application and supporting infrastructure systems that provide all of the elements necessary for that application to perform its business function. |
| VA Medical Center (VAMC): | VAMCs are stand-alone datacenters that provide healthcare-specific IT functionality to individual medical center facilities. The VAMC designation (for the purposes of this instruction) is made by NDCP. |