UNDERSTANDING
SURGE PROTECTIVE DEVICES SURVEY

In 2021, the **Electrical Safety Foundation International** surveyed industrial and commercial facility professionals, including managers, owners, building engineers, heads of maintenance, and related occupations. These professionals **provided insights** regarding power surge incidences and effects, as well as usage of **Surge Protective Devices** in the facilities they manage.

COMMON VOLTAGE SURGE CAUSES

- **Switching** of Electrical Loads
- Lightning
- **Faulty** Wiring and/or Connections
- **Damage** to Power Lines

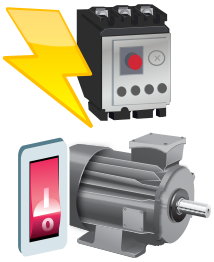
INSTALL SURGE PROTECTIVE DEVICES TO PREVENT DOWNTIME & PROTECT EQUIPMENT

SURGE PROTECTIVE DEVICES WORK

79% of facilities state that **Surge Protective Devices** have cut down on the amount of **downtime** and **equipment failure.**

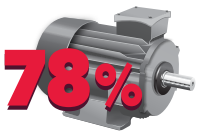
UNPLANNED OUTAGES CAUSES

34% of unplanned outages are caused by **power surges** and **unexpected resetting** or **mis-operation** of equipment (Commonly caused by power surges).



Unexpected downtime is common with over **72%** of facilities surveyed experiencing downtime more than a few times a year.

23% of facilities installed Surge Protective Devices after **experiencing a surge event**



78% of equipment failure caused by power surges were in service for **five years or less**

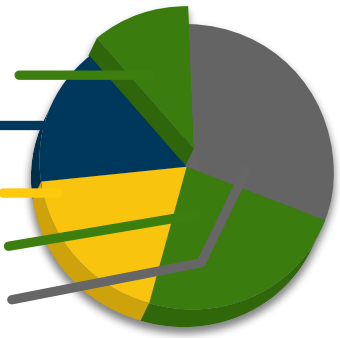
49% reported that a power surge had caused an interruption **within the last 12 months**

SURGE PROTECTIVE DEVICE & POWER SURGE MISCONCEPTIONS

Respondent's knowledge of surge protective capabilities revealed mixed results.

WHAT CAN A TYPICAL SURGE PROTECTIVE DEVICE PROTECT AGAINST?

- ✓ **Motor Starts/Stops or Load Switching** 11%
- ~~Direct Lightning Strike~~ 16%
- ~~Sustained Overvoltage~~ 19%
- ✓ **Voltage Surge** 24%
- ~~Other~~ 30%



*Surge Protective Devices only protect against **voltage surge events**, no matter the source*

WHICH OF THE FOLLOWING DO YOU BELIEVE PROVIDE SURGE PROTECTION?

- ✓ **Surge Protective Devices** also known as Transient Voltage Surge Suppressors 38%
- ~~Other~~ 14%
- ~~Typical Power Strips~~ 8%
- ~~Consumer Uninterruptable Power Supplies (UPS)~~ 9%
- ~~Ground-Fault Circuit Interrupter (GFCI)~~ 14%
- ~~Fuses & Breakers~~ 17%

*Only **Surge Protective Devices** aka **Transient Voltage Surge Suppressors** protect against Power Surges*

VISIT **ESFI.ORG** AND **NEMASURGE.ORG** TO SEE FULL SURVEY RESULTS & LEARN MORE ABOUT SURGE PROTECTIVE DEVICES

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Facility Managers' Understanding of Power Surges and Surge Protective Devices

We received completed survey questionnaires from 210 domestic respondents identified from a database of industrial and commercial facility professionals, including managers, owners, building engineers, heads of maintenance, and related occupations. These professionals provided insights regarding power surge incidences and effects, as well as usage of surge protective devices in the facilities they manage.

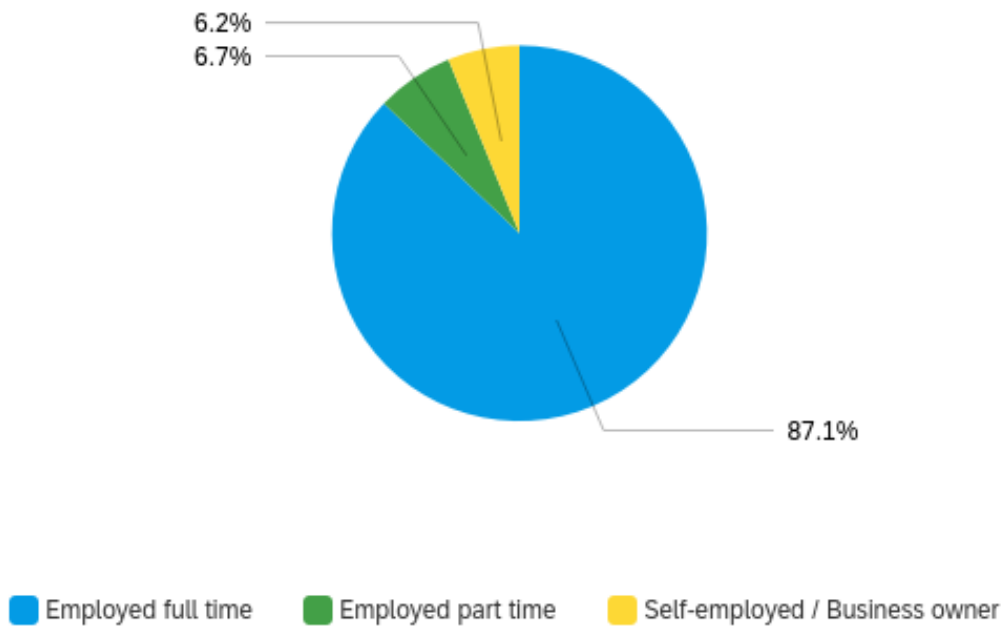
Key Findings

- The vast majority of respondents (72%) claimed to be either “very” or “extremely familiar” with voltage surges, while only 8 percent were only “slightly” or “not familiar at all”
- The most commonly-cited causes of voltage surges were “switching of electrical loads,” “lightning,” “faulty wiring and/or connections,” and “damage to power lines”
- From among the choices provided, facility managers’ answers about surge protective device installation locations were relatively evenly distributed between “service entrance” (28%), “at all or most downstream distribution panels with electrical or electronic equipment” (26%), “backup or alternative power systems” (24%), and “at all or most voltage transformation within equipment” (20%)
- Use of the question, “What can a typical surge protective device protect against,” to test respondents’ knowledge of SPD capabilities revealed mixed results with one correct response receiving the greatest share of selections while another correct answer received the lowest share. Meanwhile, two incorrect responses were similarly far-flung with one receiving the second-highest number of selections and the other garnering the second-fewest
    - Although both choices were correct, “voltage surge” (24%) and “motor starts/stops or load switching” (11%) ended at opposite poles
    - Likewise, the frequency with which respondents selected circumstances not managed by SPDs, “sustained overvoltage” (19%) and “overload caused by operating equipment above full-load rating” (14%), placed those responses near the top and bottom of the list as well
- In response to being asked which technologies provide surge protection, the most frequent selections were “surge protective devices” (24%), “fuses and breakers” (17%), and “transient voltage surge suppressors” (15%), with “typical power strips” (8%) seeing the fewest selections
- A plurality of survey panelists indicated that their facilities had had surge protection technology for one to five years (40%), and an additional 39 percent had surge protection for six or more years
- Twenty-three percent of respondents indicated that they purchased surge protection devices after experiencing a surge event, and other catalysts, such as “at build/specification” (27%) and “at renovation,” (23%) were reported at a similar frequency
- A majority of facility managers reported having surge protection devices inspected or tested monthly (54%)
    - Nearly all those who tested or inspected their SPDs (94%) did so as part of routine maintenance

- Perhaps surprisingly, more managers chose to install surge protection to "protect previously installed equipment" (39%) and "as part of a renovation project" (24%) than to "protect recently installed equipment" (20%)
- When asked about success stories regarding installed surge suppression, many mentioned maintaining uptime in the midst of lightning strikes or grid anomalies, while several others noted that the absence of visible evidence of surge activity in general suggested successful operation of surge protection devices
- Among the handful of respondents that do not currently have surge protection installed, most (62%) said that it has been recommended for their facilities
    - Twenty-one percent of those without surge protection say that they plan on installing it in the future
- Unexpected downtime was a relatively frequent event, with 72 percent reporting experiencing downtimes more than a few times a year
    - Downtimes are typically brief, lasting one hour or less, according to 65 percent of respondents
    - Power surges (14%) were the third-most commonly cited cause of unplanned outages following human error (21%) and accidents (18%)
    - Although a handful of respondents' reported costs skewed the mean measurement, the median annual cost of downtime was $5,000
- Asked of those whose facilities had ever experienced unexpected downtime (n=205), 49 percent reported that a power surge had caused such an interruption within the last 12 months
    - The most recent power surge-caused downtime reported by respondents resulted in being offline for between 30 and 60 minutes for 42 percent of facility managers, and the vast majority (90%) of incidents lasted for one and a half hours or less
    - Of those whose facilities experienced unplanned downtime, 49 percent indicated that a power surge had taken operations offline within the last 12 months, with most of those outages (68%) lasting one hour or less
    - Voltage surges resulted in equipment restart or mis-operation for 57 percent of responding managers, with slightly fewer facilities operators reporting power outage or equipment failure (53%) because of such incidents
    - For 63 percent of respondents, the most recent voltage surge at their facilities occurred quite recently, no more than three months prior to responding to the survey
    - However, most facilities experienced voltage surges relatively infrequently, as 59 percent reported surges happening "a few times a year," "once every year or two," or "almost never"
    - Power fluctuations on the grid (27%) were the most commonly mentioned cause of facility voltage surges, followed closely by "faulty wiring and/or connections" (25%), and "lightning" (22%)
    - On average, facility managers indicated that 60 percent of voltage surges affecting their facilities resulted from outside factors
    - Equipment recently placed in service seem to have borne the brunt of voltage surges that resulted in failure, with 78 percent of failed equipment having been in service for five years or less
    - Surge protective devices were clearly viewed as a success by most respondents, as 79 percent estimated that downtime/equipment failure was reduced significantly or completely
    - Of those who reported equipment failure for any reason after warranty expiration (n=163), most failures (85%) happened recently, within 5 or fewer years of warranty expiration date

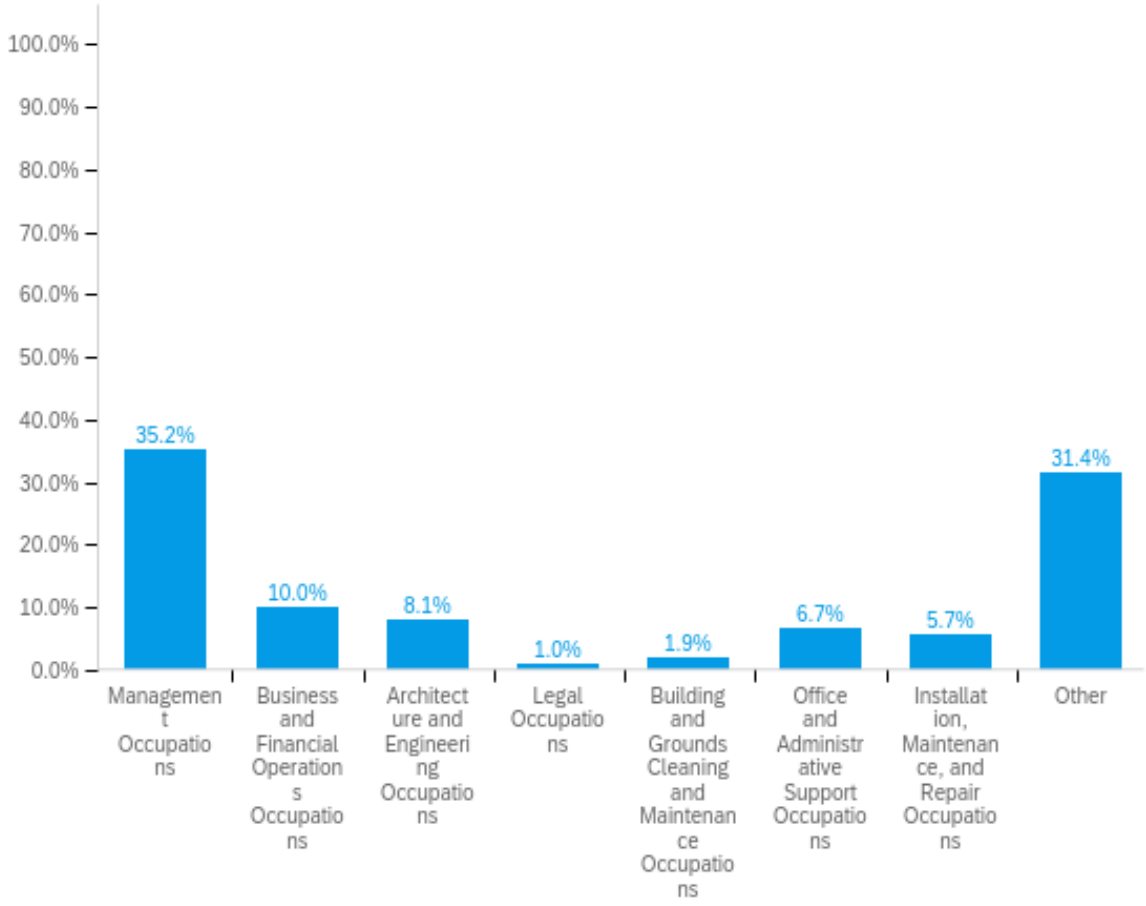
- Although a somewhat concerning 16 percent of respondents had never performed a resistance reading on their facility's grounding systems or were not sure when one was last conducted, nearly 71 percent had done so within the last 12 months

How would you describe your current employment status?



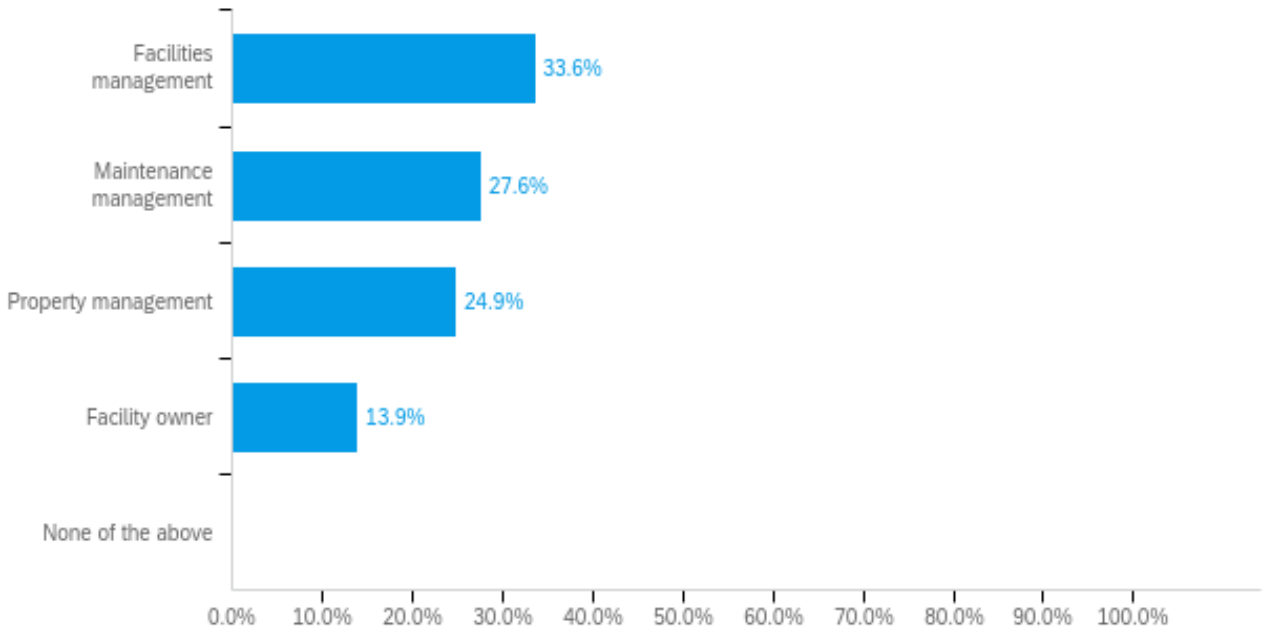
Answer	%	Count
Employed full time	87.1%	183
Employed part time	6.7%	14
Self-employed / Business owner	6.2%	13
Unemployed / Looking for work	0.0%	0
Student	0.0%	0
Homemaker	0.0%	0
Retired	0.0%	0
Other	0.0%	0
Total	100%	210

Please indicate your occupation:



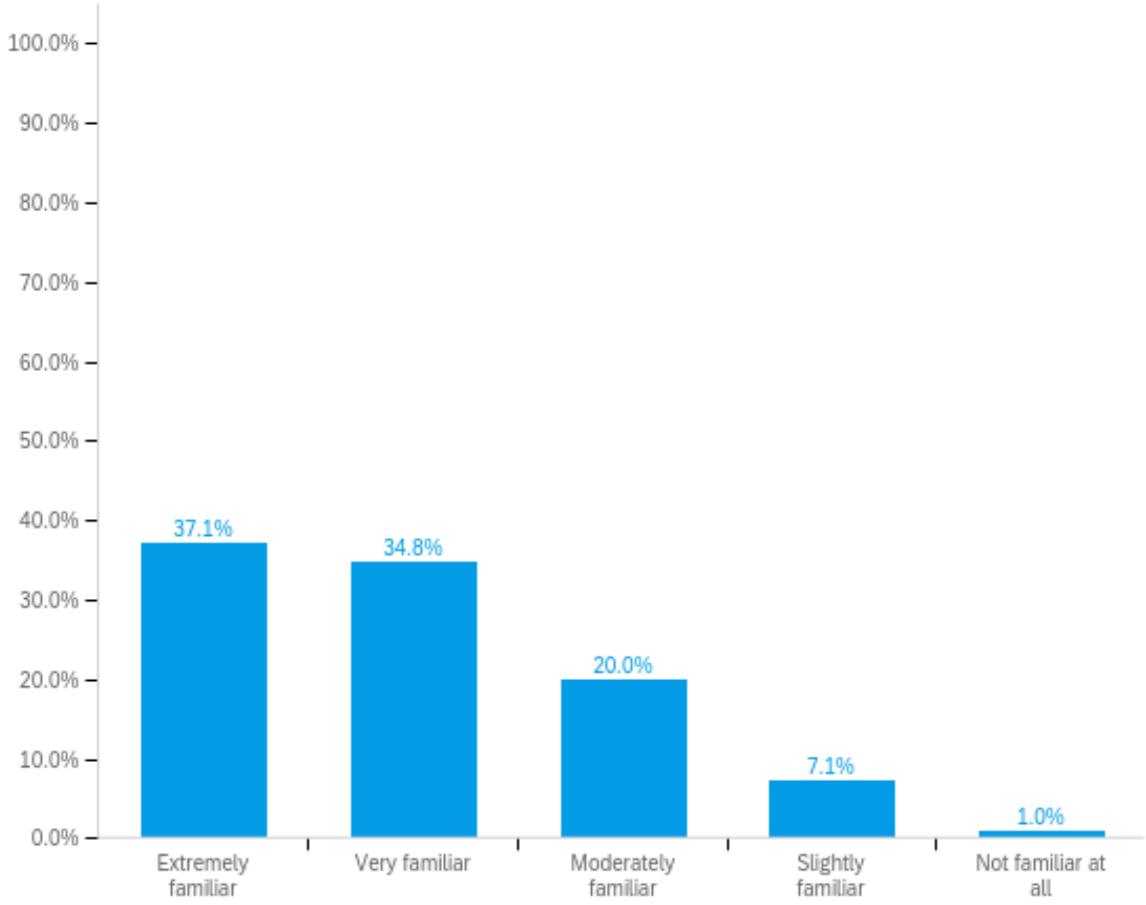
Answer	%	Count
Management Occupations	35.2%	74
Business and Financial Operations Occupations	10.0%	21
Computer and Mathematical Occupations	0.0%	0
Architecture and Engineering Occupations	8.1%	17
Life, Physical, and Social Science Occupations	0.0%	0
Community and Social Service Occupations	0.0%	0
Legal Occupations	1.0%	2
Education, Training, and Library Occupations	0.0%	0
Arts, Design, Entertainment, Sports, and Media Occupations	0.0%	0
Healthcare Practitioners and Technical Occupations	0.0%	0
Healthcare Support Occupations	0.0%	0
Protective Service Occupations	0.0%	0
Food Preparation and Serving Related Occupations	0.0%	0
Building and Grounds Cleaning and Maintenance Occupations	1.9%	4
Personal Care and Service Occupations	0.0%	0
Sales and Related Occupations	0.0%	0
Office and Administrative Support Occupations	6.7%	14
Farming, Fishing, and Forestry Occupations	0.0%	0
Construction and Extraction Occupations	0.0%	0
Installation, Maintenance, and Repair Occupations	5.7%	12
Production Occupations	0.0%	0
Transportation and Material Moving Occupations	0.0%	0
Military Specific Occupations	0.0%	0
Other	31.4%	66
Total	100%	210

In carrying out the responsibilities of your occupation, does your role involve any of the following? (select all that apply)



Answer	%	Count
Facilities management	33.6%	123
Maintenance management	27.6%	101
Property management	24.9%	91
Facility owner	13.9%	51
None of the above	0.0%	0
Total	100%	366

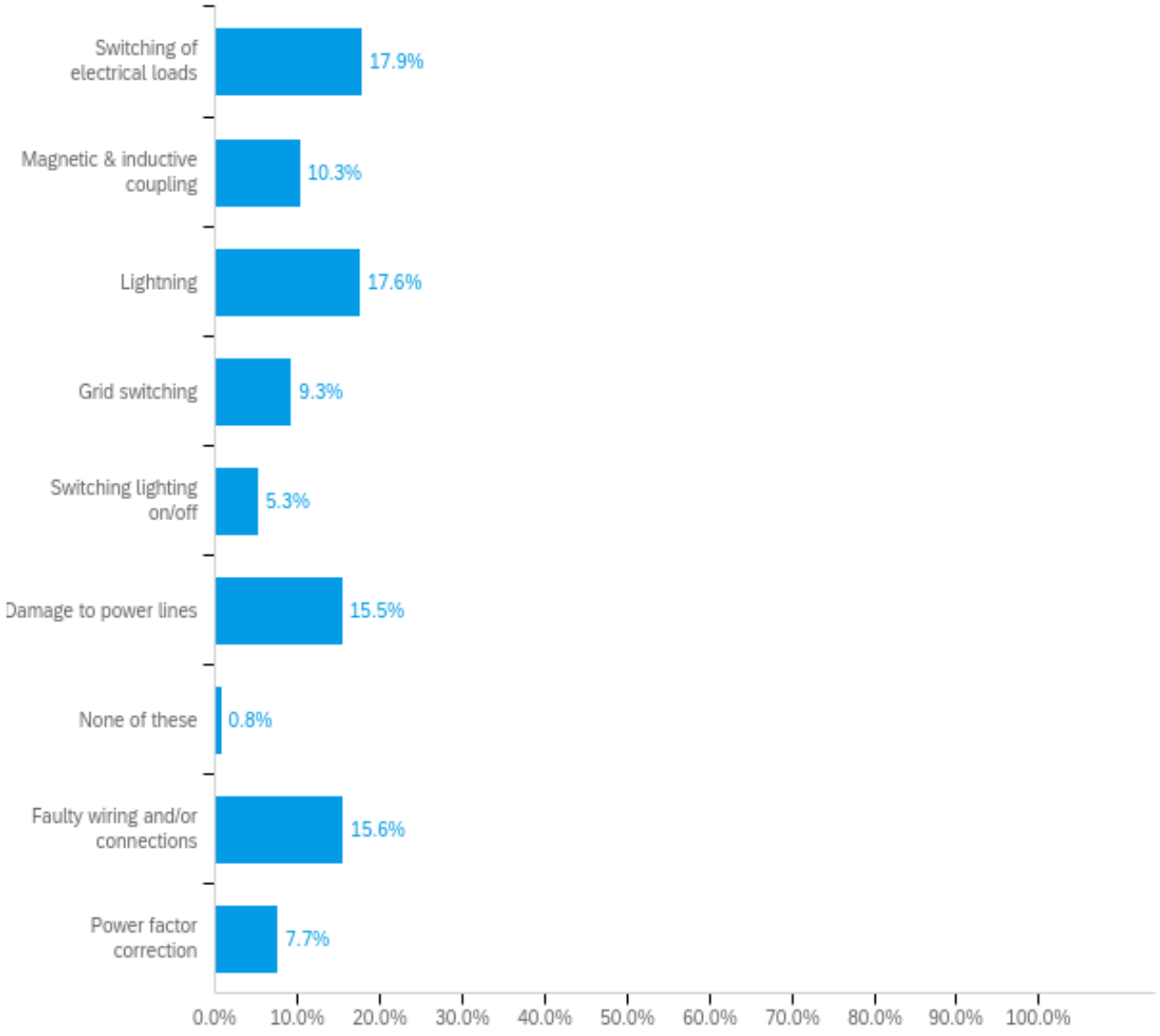
How familiar are you with voltage surges, also known as power surges, spikes, or transients?



Field	Count	Bottom 2 Box	Top 2 Box
How familiar are you with voltage surges, also known as power surges, spikes, or transients?	210	71.9%	8.1%

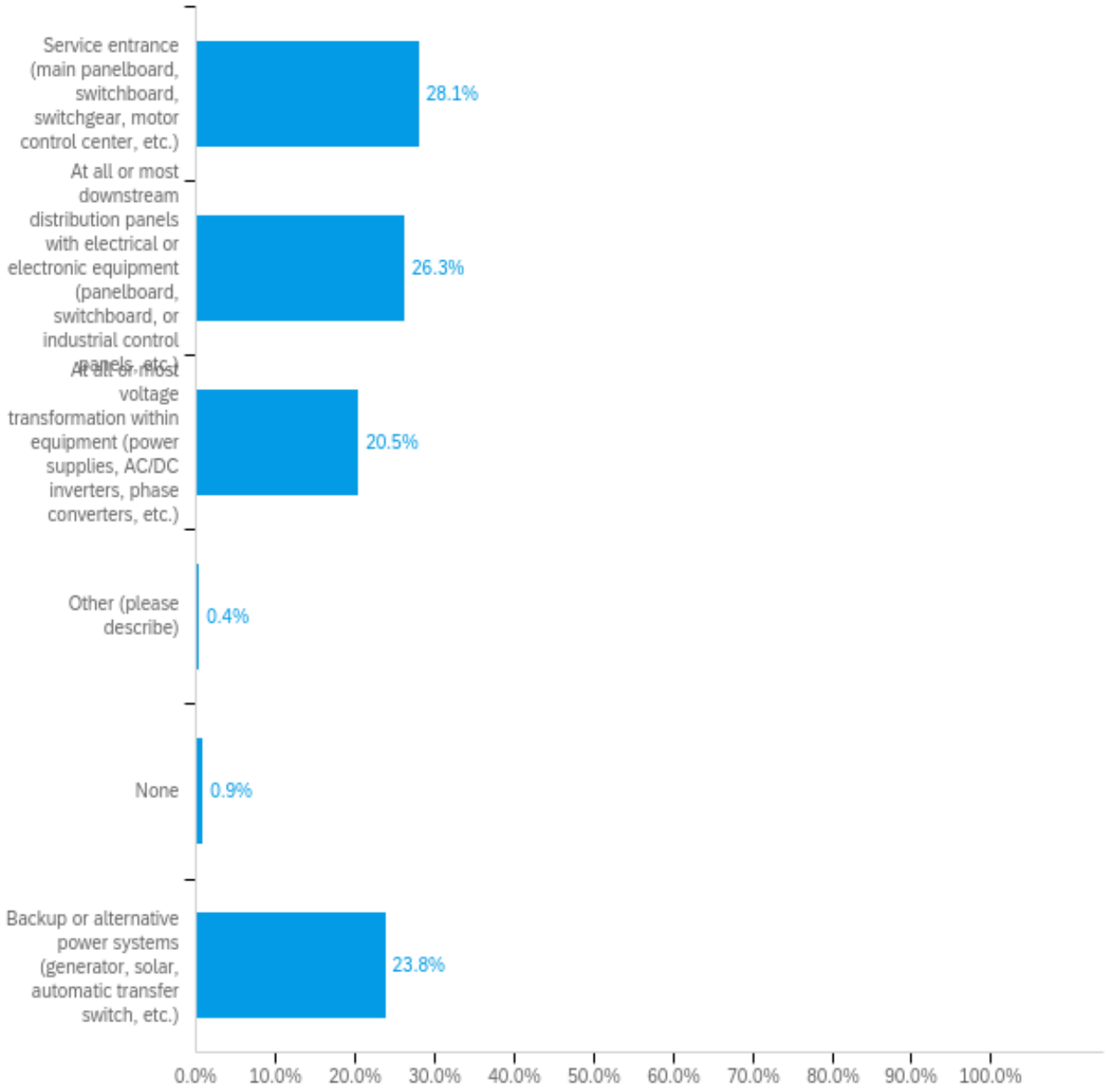
Answer	%	Count
Extremely familiar	37.1%	78
Very familiar	34.8%	73
Moderately familiar	20.0%	42
Slightly familiar	7.1%	15
Not familiar at all	1.0%	2
Total	100%	210

Which of the following may cause voltage surges? [select all that apply]



Answer	%	Count
Switching of electrical loads	17.9%	142
Magnetic & inductive coupling	10.3%	82
Lightning	17.6%	140
Grid switching	9.3%	74
Switching lighting on/off	5.3%	42
Damage to power lines	15.5%	123
None of these	0.8%	6
Faulty wiring and/or connections	15.6%	124
Power factor correction	7.7%	61
Total	100%	794

In what locations of your facility are surge protective devices installed? [select all that apply]

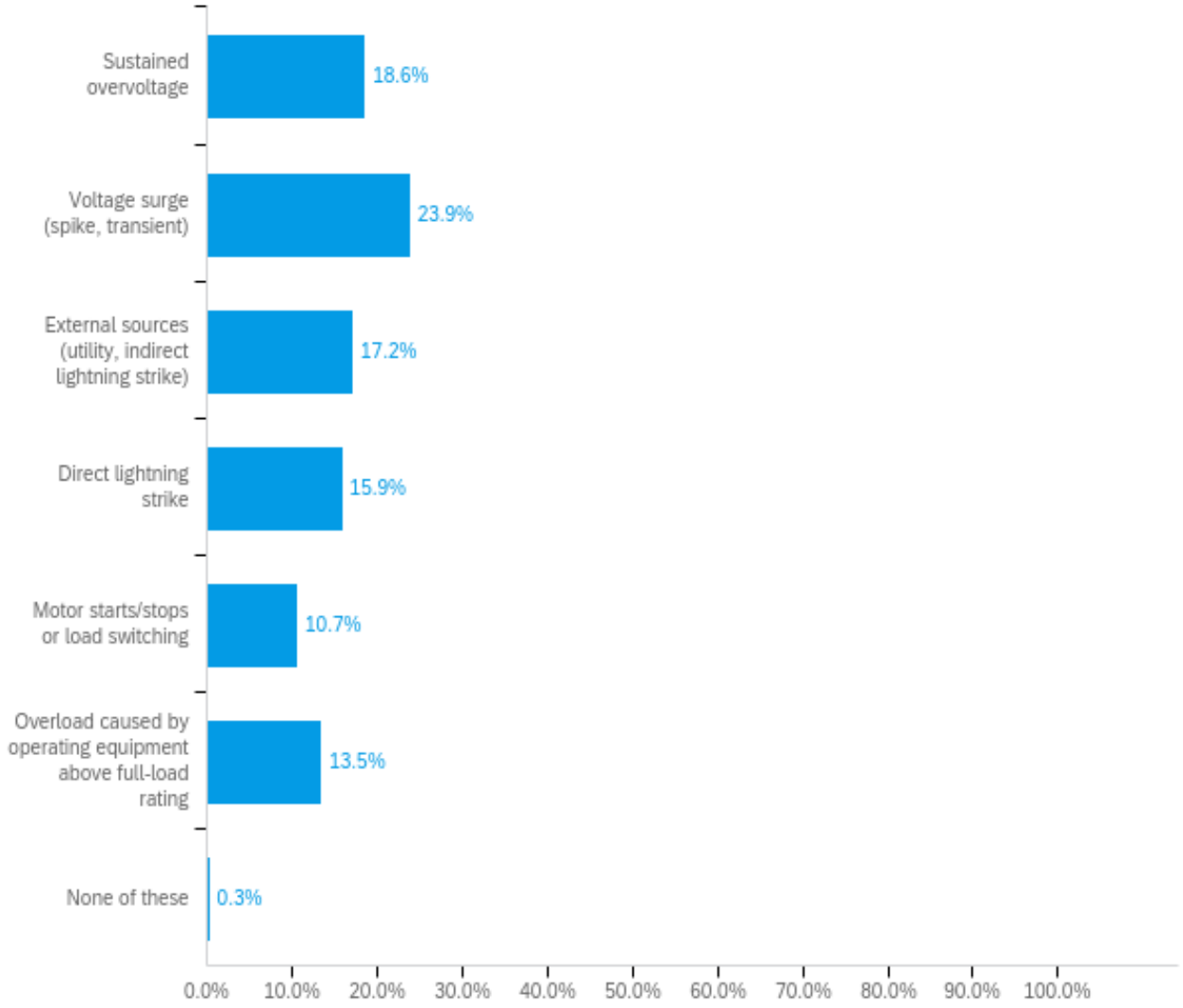


Answer	%	Count
Service entrance (main panelboard, switchboard, switchgear, motor control center, etc.)	28.1%	126
At all or most downstream distribution panels with electrical or electronic equipment (panelboard, switchboard, or industrial control panels, etc.)	26.3%	118
At all or most voltage transformation within equipment (power supplies, AC/DC inverters, phase converters, etc.)	20.5%	92
Other (please describe)	0.4%	2
None	0.9%	4
Backup or alternative power systems (generator, solar, automatic transfer switch, etc.)	23.8%	107
Total	100%	449

“Other” response:

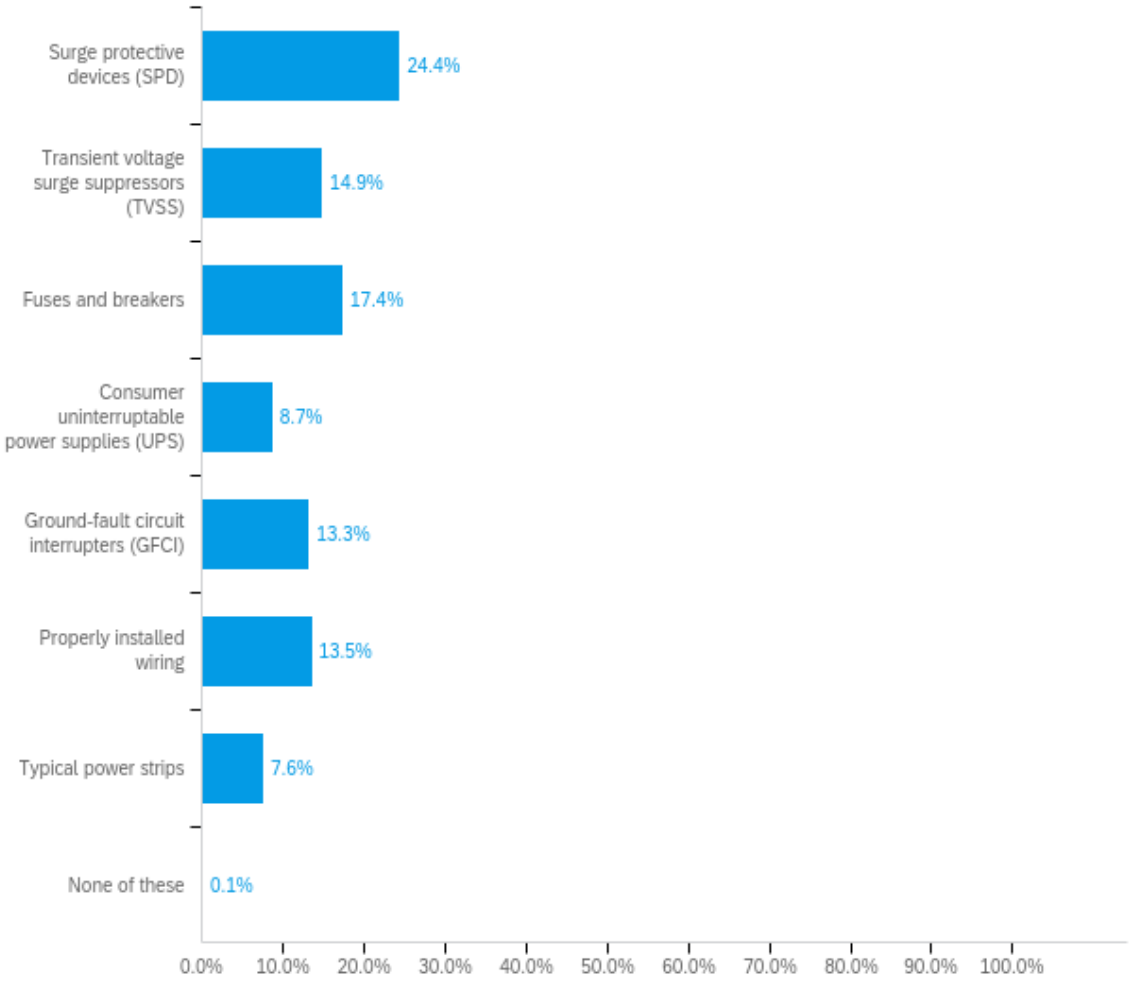
- As far as I know, We have them basically everywhere. My business is very computer orientated. 90% of most people employed here, Work from a PC or laptop.
- surge protector outlets

What can a typical surge protective device protect against? [select all that apply]



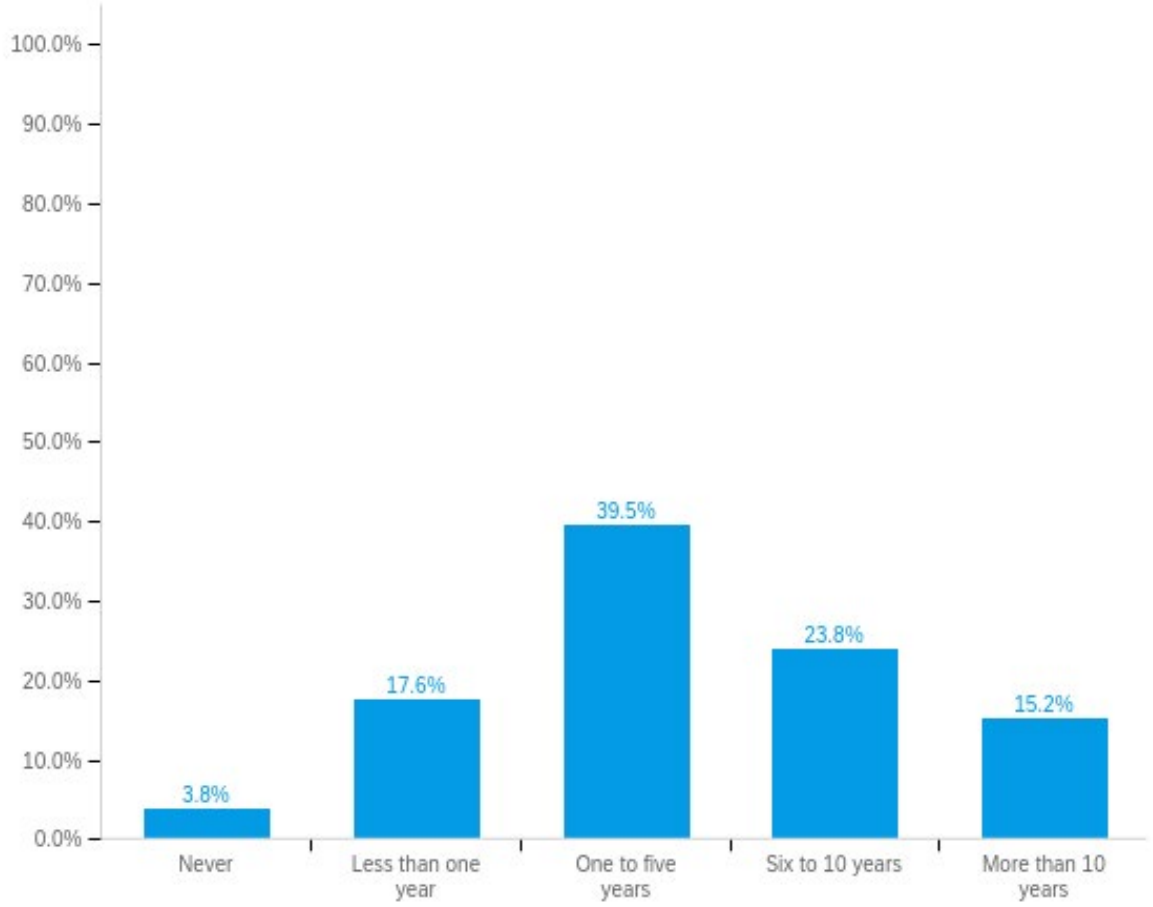
Answer	%	Count
Sustained overvoltage	18.6%	131
Voltage surge (spike, transient)	23.9%	168
External sources (utility, indirect lightning strike)	17.2%	121
Direct lightning strike	15.9%	112
Motor starts/stops or load switching	10.7%	75
Overload caused by operating equipment above full-load rating	13.5%	95
None of these	0.3%	2
Total	100%	704

Which of the following do you believe provide surge protection? [select all that apply]



Answer	%	Count
Surge protective devices (SPD)	24.4%	177
Transient voltage surge suppressors (TVSS)	14.9%	108
Fuses and breakers	17.4%	126
Consumer uninterruptable power supplies (UPS)	8.7%	63
Ground-fault circuit interrupters (GFCI)	13.3%	96
Properly installed wiring	13.5%	98
Typical power strips	7.6%	55
None of these	0.1%	1
Total	100%	724

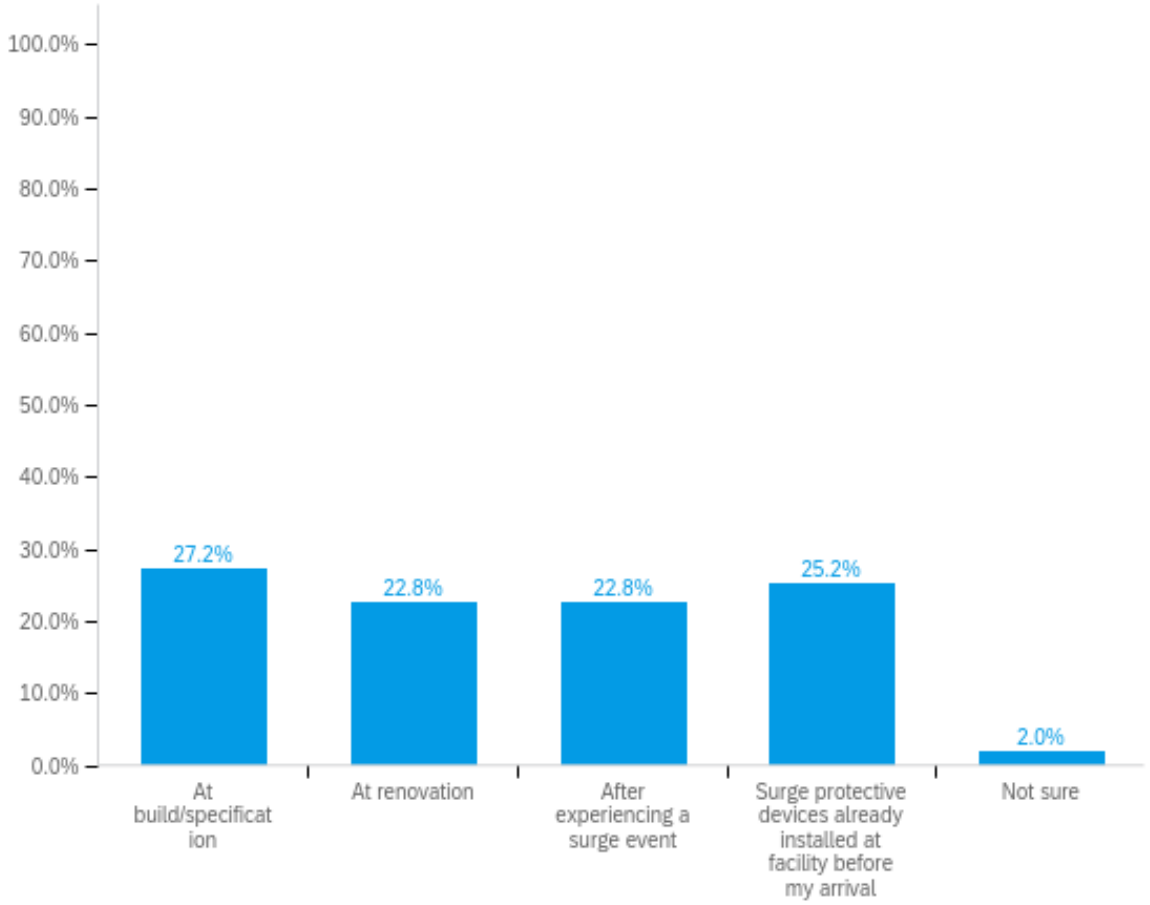
How long has your facility had surge protection technology? [Note: if you manage more than one facility, please answer in terms of the most recent addition of surge protection technology]



Field	Count	Bottom 2 Box	Top 2 Box
How long has your facility had surge protection technology? [Note: if you manage more than one facility, please answer in terms of the most recent addition of surge protection technology]	210	21.4%	39.0%

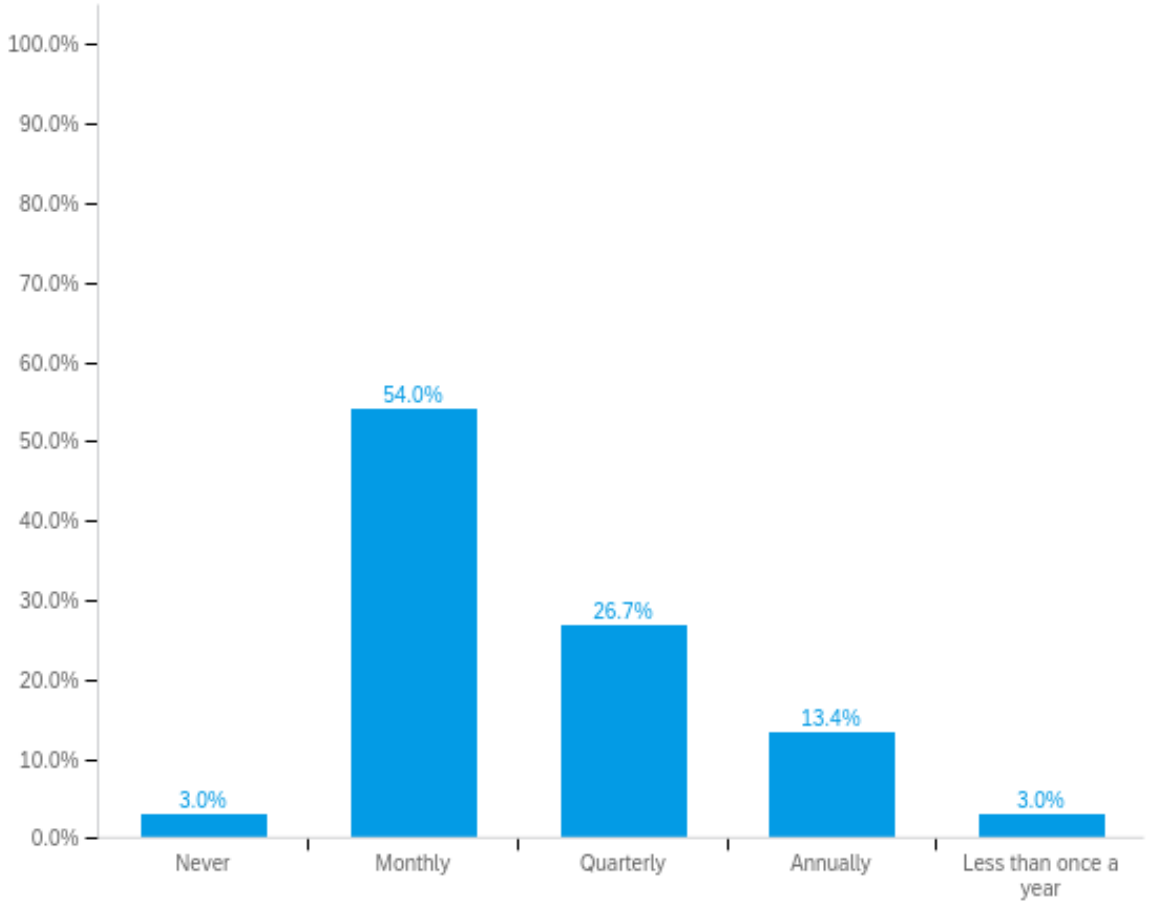
Answer	%	Count
Never	3.8%	8
Less than one year	17.6%	37
One to five years	39.5%	83
Six to 10 years	23.8%	50
More than 10 years	15.2%	32
Total	100%	210

When did you first purchase surge protective devices for your facility?



Answer	%	Count
At build/specification	27.2%	55
At renovation	22.8%	46
After experiencing a surge event	22.8%	46
Surge protective devices already installed at facility before my arrival	25.2%	51
Not sure	2.0%	4
Total	100%	202

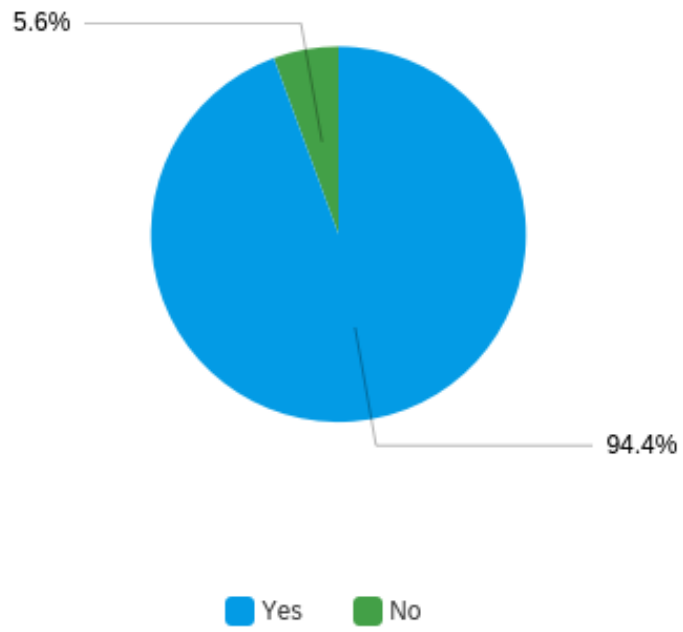
How frequently do you have your surge protective devices inspected/tested?



Field	Count	Bottom 2 Box	Top 2 Box
How frequently do you have your surge protective devices inspected/tested?	202	56.9%	16.3%

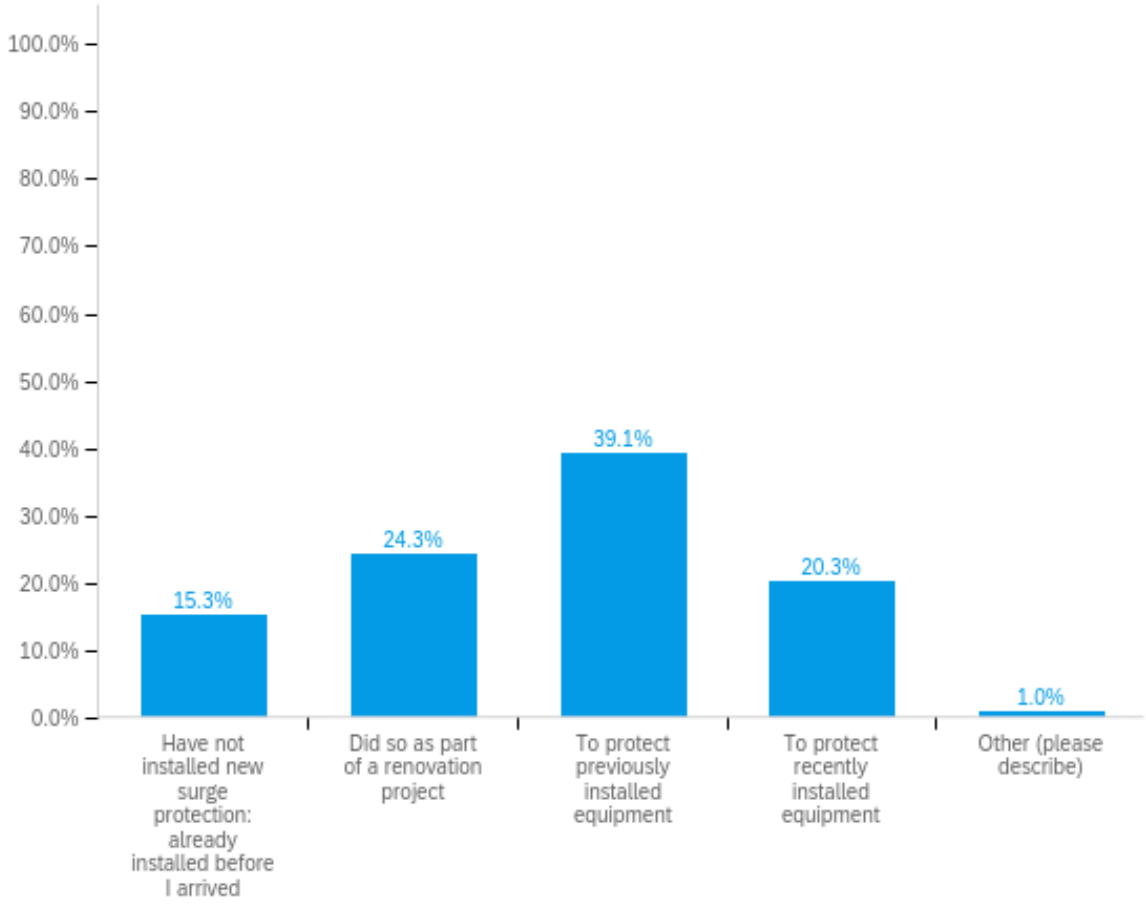
Answer	%	Count
Never	3.0%	6
Monthly	54.0%	109
Quarterly	26.7%	54
Annually	13.4%	27
Less than once a year	3.0%	6
Total	100%	202

Is inspection/testing of your facility's surge protective devices part of your overall routine maintenance/inspection plan?



Answer	%	Count
Yes	94.4%	185
No	5.6%	11
Total	100%	196

What is the main reason why you chose to install surge protection in your facility?



Answer	%	Count
Have not installed new surge protection: already installed before I arrived	15.3%	31
Did so as part of a renovation project	24.3%	49
To protect previously installed equipment	39.1%	79
To protect recently installed equipment	20.3%	41
Other (please describe)	1.0%	2
Total	100%	202

“Other” response:

- Maintain all operations

Please describe any surge protection successes at your facility.

- Reduce faults by 50%
- surge protector protecting my electronics device from random power spike damage.
- It helps me to increase the useful life of my equipment, and to protect the saved data and avoid great damage
- It has helped us tremendously protect our electrical devices. We can tell a big difference in operations with no blinking lights or power surges.
- Protection of electrical tools
- The addition of the surge protection device was effective in maintaining the integrity of the equipment
- we have frequent power outages, we have several computers and electronic devices so it is important for us to protect our equipment
- breakers successfully shut off due to over heating
- It has faced a very good reaction from people where I work, and helped to reduce the damage of the machines and the electricity as a whole
- surge protection and hardware shortage protection
- The effect of the lightning was avoided
- Several devices were rescued from the danger of lightning
- This contributed to support the machines and reduce damage
- It's almost impossible to imagine a modern building without heating and air conditioning
- It has successfully protected all machines from overload with this protection, which is a great achievement
- It makes us feel more safe during any unexpected types of electric issues
- protect the machines from sudden surges
- not to be exposed to any dangers
- There is a very high protection ratio.
- to be more safe
- Never needed yet
- We haven't had any issues as of yet.
- During thunder storm and lightning hit nearby
- I remember using Teckin Smart power strip
- The risk of an accident is reduced.
- Have had many overloads due to storm damage, was able to be 100% operational with no damage to equipment
- surge protectors on computers and overall protection on inverters
- there were a few hurricanes and the power went out but due to surge protection business was not interrupted
- protect machine from damage
- protection from breakdowns and increase in productivity
- My company is protected from electrical overloads and lightning strikes
- Increased facility protection from lightning strikes
- No interruption of service during any snowstorm or weather event.
- UPS is best for surge protection
- electromagnetic interference/radio-frequency interference (EMI/RFI)

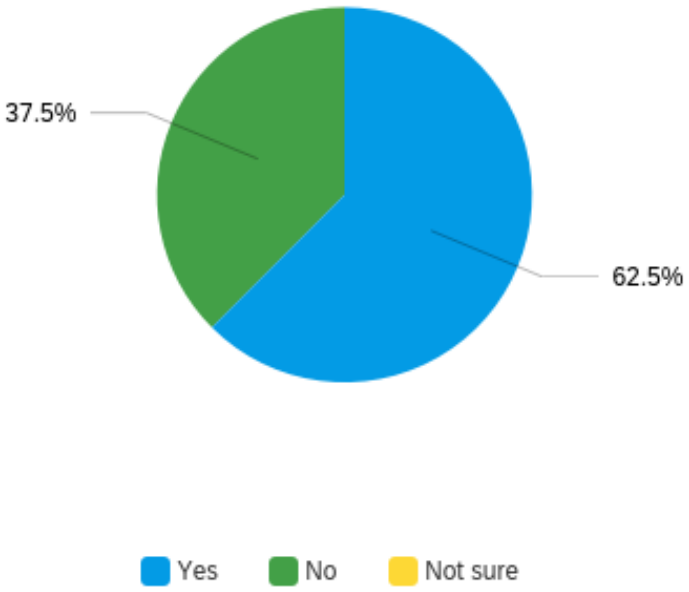
- We are in an area where lightning is very common. I do not know how many times lightning has struck peoples cars, Trucks and even our main power transformer, we were out of power for almost 3 hours, This was a common occurrence. Now, Since we put protection in place to fight back. We have not had any problems. Now peoples cars still get hit on the way in. We are in a very secluded industrial area.
- protection from high tension as a result of lightning
- we got no damage.
- We have not had any problems with the power being out against the surge.
- I think my company have all electrical security that we need
- nothing comes to mind at the moment...a protection success means that i wouldn't know if a surge protection was successful or not!
- Our surge protector saved our servers from a lightning strike to a local transformer
- correctly install electrical wiring and add circuit breakers regularly
- so far we have been protected during large storms
- Haven't had an episode yet.
- Protection of people and equipment
- I haven't seen any increase in the electric current since I started working
- keep electrical circuits from sabotage
- there is a lot of protection in my facility and we take a good care of it
- the company's electrical network has been successfully protected
- Our local power company had cut wires by our building and we experienced a brown out, I think it worse than when the power is completely out.
- We use this protection on all circuit s involving a our electronics with very good success.
- Fears of over current at the facility were mitigated.
- We were able to curb power surge spikes
- The organizers did not experience any malfunctions due to the installation of the heating devices
- Electricity regulator that raises the voltage and protects the machines from different frequencies
- A POWER GRID SURGE WAS AVOIDED AND DAMAGE TO MFG EQUIPMENT
- We've had great success in keeping our breaker boxes clear and easy to get to, maintaining electric outlets, and provide surge protectors for outlets with multiple cords.
- THE facility was hit by a lightning bolt and passed it successfully with surge protection
- Surge protection has been of help ever since it was installed after experiencing power outage caused by lightning few years ago which led to some equipment to become faulty. But since the installation of the surge protection, power as been smooth and not affected by high voltage
- We have had zero problems with power surges so we must be doing something right
- Surge protection success was goal reached for our company
- We have not experienced any damage
- Some of the devices in the company were exposed to an increase in the current, which leads to an increase in our anxiety, but now it is safer
- there is no damage in storms
- The last one that happened, if not for my surge protector, it would have destroyed my laptop
- When it happens or lightning as well as when loading the overload because of the large use of electricity and has been successfully protected and envious
- We have had no incidents to speak of

- Significantly reduce electrical failures... Power to meet the needs of the plant
- Back in 2019 we had a winter storm the winds were very heavy also was raining and then all of a sudden loss direct power but instantly because of the newly installed system we have we're up and running in less than 10 minutes
- We had a lightning strike that tripped a breaker preventing a blowout
- In the winter when we use more heating lamps for patio dining, the surge protection prevents sudden power shut-offs to some electrical outlets.
- It has saved all the computers several times.
- There was a time there was a high voltage and rather than affect the main equipment, it only affected the surge protectors.
- Protection of facility equipment from lightning strikes and increased efforts
- A large thunder and rainstorm came rolling through the area and directly at my facility. Lightning struck the building twice and the surge protectors came instantly into use and saved all our hardware and software
- Bad storms and lightning and still good power.
- That is classified information
- At breaker box and monitored by 3rd party remotely.
- We had lightning hit our building and our protectors worked.
- Thunderbolt protection
- over voltage protection, rain and lightning surge
- We've had some of our equipment saved from being fried with our surge protection equipment.
- lighting struck and nothing happened
- The electric current has been kept stable
- We have protection over all areas
- Differential protection
- The use of electrical regulator machines
- Protect devices from damage
- Last months we had a snowstorm and some cables came down In one of the buildings so the surge protection shutdown quickly preventing any hazards
- CNC Transient Surge & Lightning Protection
- success has been achieved in protecting the devices in my company from damage
- the dampers have helped protect may computers and thus the property of the facility
- all attempts
- no need to use it yet
- there was an outage due to an recent storm and the surge came in handy
- Back in 2019 during the blackout our company's surge protection protected our equipment and maintained the company's safety.
- We have had no outages in last five years since we went though a thorough evaluation.
- Power system recovery facility.
- made a surge protection for my office & it was successfully done.
- Minimizing faults as much as possible and causing contact that causes great danger to electrical devices
- yes we did an upgrade and prevented unexpected power cuts
- We dealt with a huge outage of 5 year mechanical devices and the update Took place early December and we haven't had outages since.

- by having it installed it protected all of our equipment from recent severe lightning storms.
- Sandy storm, it helped turn all equipment off safely
- we got enough backup that i don’t gotta worry about any problems
- Lightning hit and it worked
- Surge protection has definitely protected our facility multiple times throughout the years
- Power has not went out since installing it
- We have had times where printers at registers could have burned up but the surge protectors did their job
- When the winter storm hit Texas and the power was intermittent.
- A few months earlier a voltage surge was prevented by the preventive technology which was due to faulty wiring and over voltage issue.
- Do to hurricane our building lost power but we had emergency lights and none of our equipment was damaged when the power went out.
- The surge protection of success at our facility is very important to use ore CVS current provider
- We have never had any spikes due to the perfectly installed surge protection.
- Maintaining complete equipment and constant reassurance that there are no dangers
- Surge protectors
- It's been great saving my equipment in many ways.
- None needed
- Less power surges, more stable output
- When lighting struck during a hurricane, the equipment was still protected
- UPS backed up Server rooms
- I did a surge protection success at my facility
- Had power interruption during storm which could have caused damage to machinery
- High voltage machine shop
- It was installed after we had a lightning hit and damaged all of out equipment 3 years ago
- Some of the surge protection we've had covers and protects from power surges and such because the electrical wiring
- We use them to prevent from voltage strikes and completely crisp down our hardware
- It re-routes the voltage when voltage is more than enough
- We have not had any tech fires in 2 years. Everything is protected and our breaker trip system is top notch
- We have prevent surges and outages by having surge protections

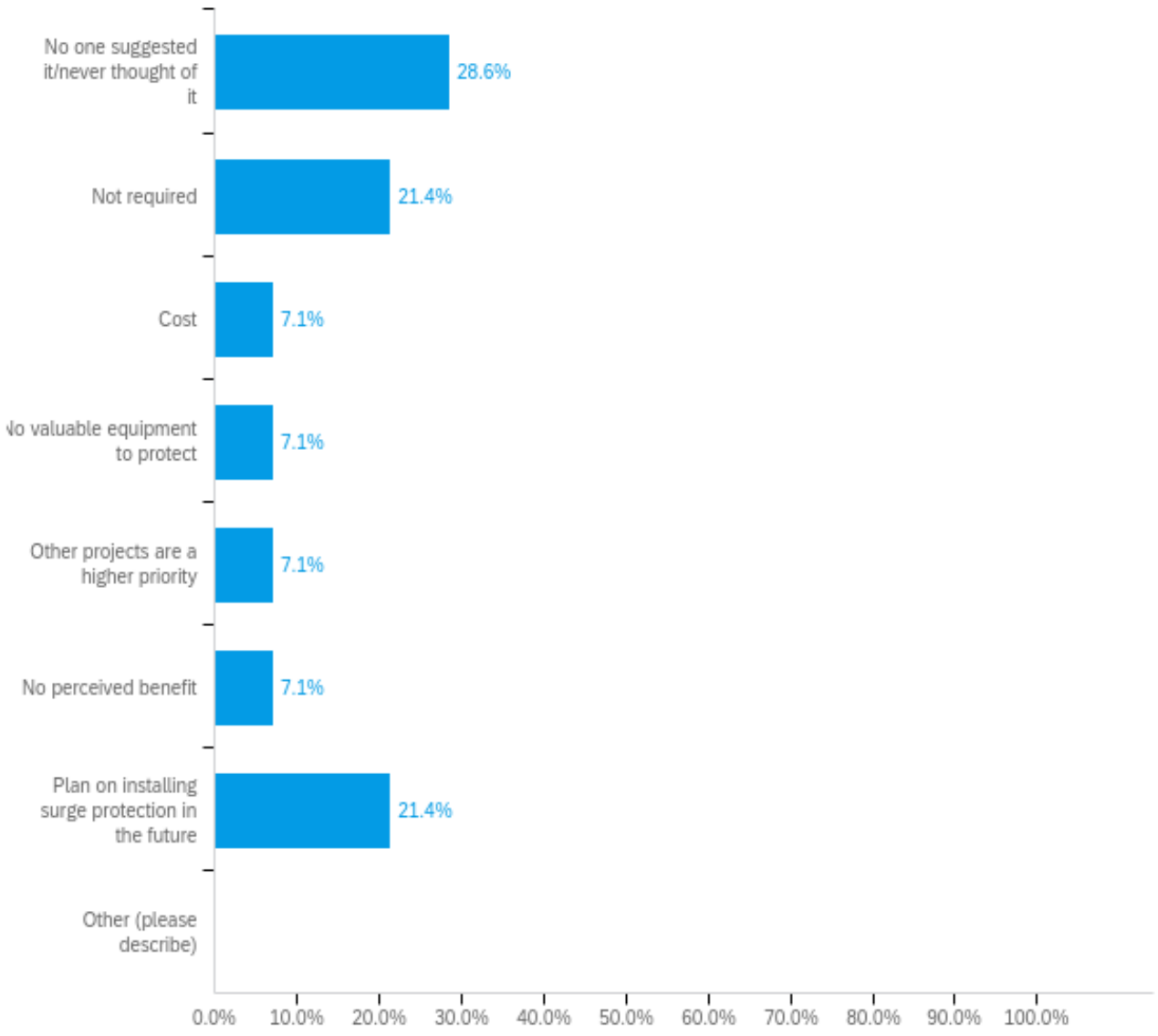
Please describe any surge protection successes at your facility. Words most frequently used by respondents:

Has surge protection been recommended for your facility?



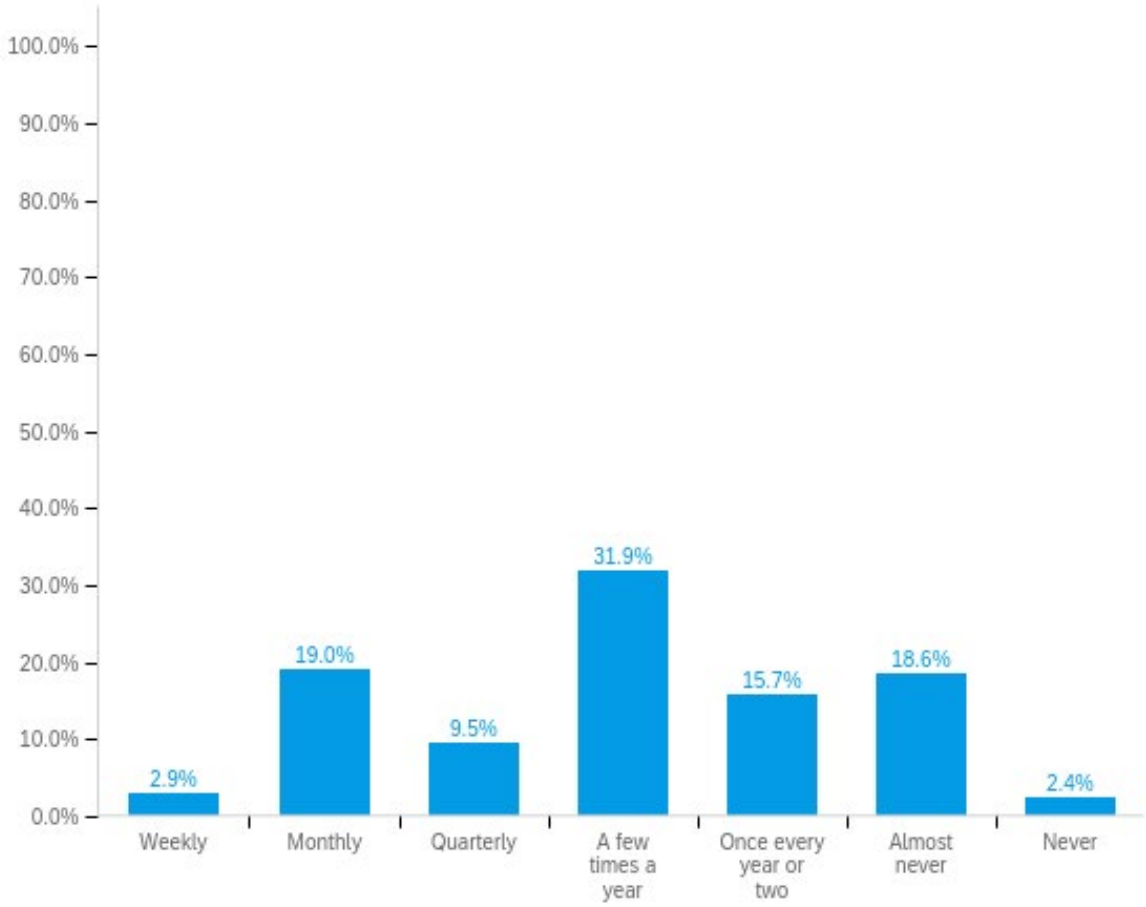
Answer	%	Count
Yes	62.5%	5
No	37.5%	3
Not sure	0.0%	0
Total	100%	8

Why did you decide not to have surge protective devices installed in your facility? [select all that apply]



Answer	%	Count
No one suggested it/never thought of it	28.6%	4
Not required	21.4%	3
Cost	7.1%	1
No valuable equipment to protect	7.1%	1
Other projects are a higher priority	7.1%	1
No perceived benefit	7.1%	1
Plan on installing surge protection in the future	21.4%	3
Other (please describe)	0.0%	0
Total	100%	14

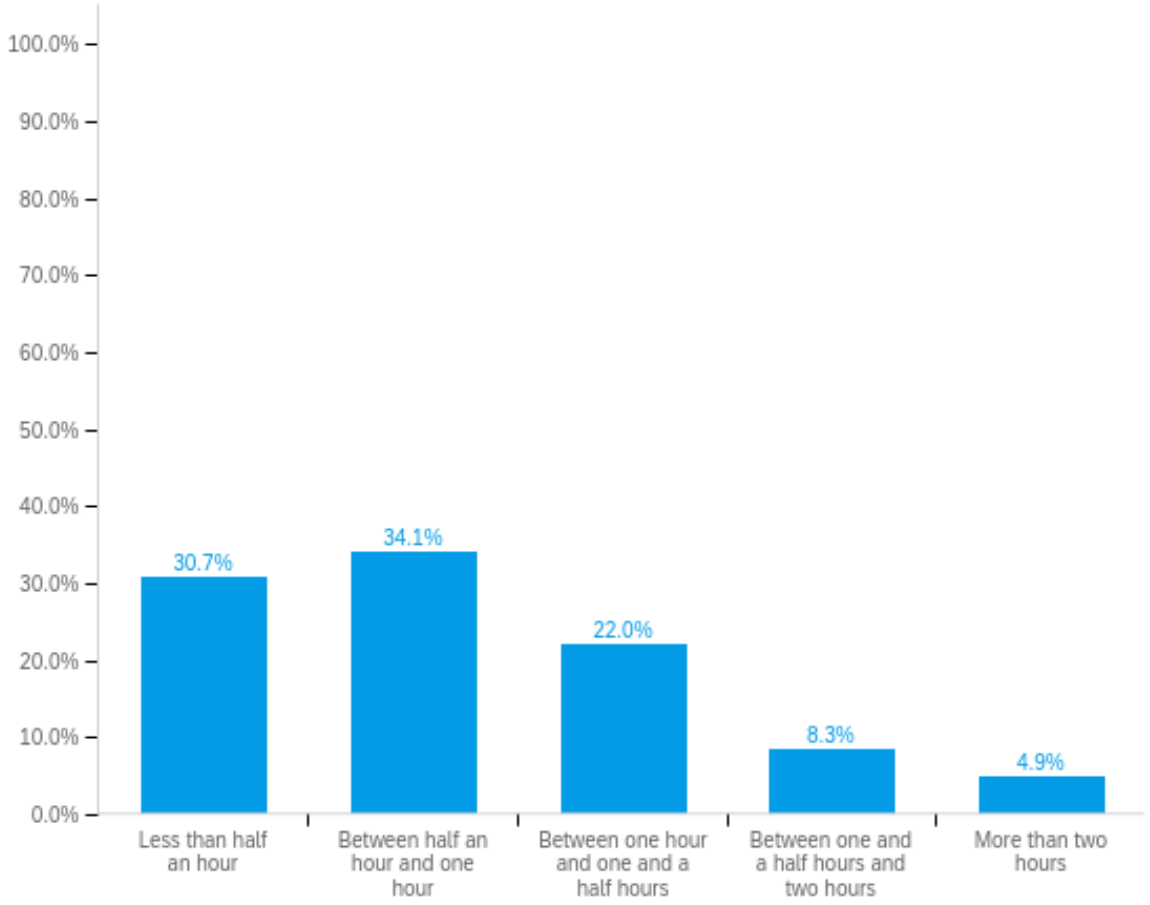
How often does your facility experience unplanned downtime from any cause?



Field	Count	Bottom 2 Box	Top 2 Box
How often does your facility experience unplanned downtime from any cause?	210	21.9%	21.0%

Answer	%	Count
Weekly	2.9%	6
Monthly	19.0%	40
Quarterly	9.5%	20
A few times a year	31.9%	67
Once every year or two	15.7%	33
Almost never	18.6%	39
Never	2.4%	5
Total	100%	210

When it occurs, how long is your facility typically affected by unexpected downtime?



Field	Count	Bottom 2 Box	Top 2 Box
When it occurs, how long is your facility typically affected by unexpected downtime?	205	64.9%	13.2%

Answer	%	Count
Less than half an hour	30.7%	63
Between half an hour and one hour	34.1%	70
Between one hour and one and a half hours	22.0%	45
Between one and a half hours and two hours	8.3%	17
More than two hours	4.9%	10
Total	100%	205

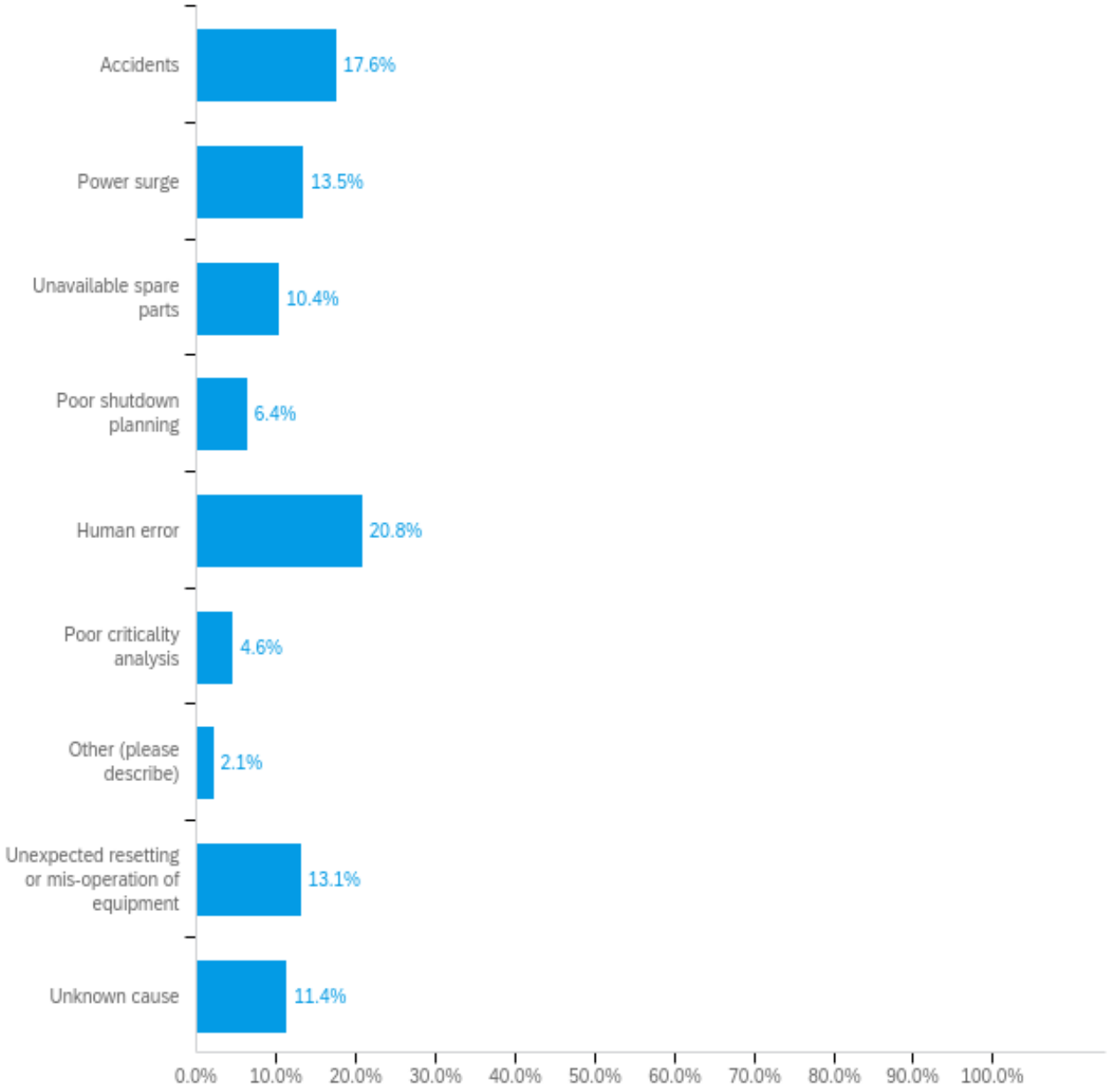
What would you estimate was the total yearly cost to your facility because of unplanned downtime in a typical year? [Please answer in terms of U.S. Dollars. Use numbers only, no punctuation]

Field	Mean	Std Deviation	Count
What would you estimate was the total yearly cost to your facility because of unplanned downtime in a typical year? [Please answer in terms of U.S. Dollars. Use numbers only, no punctuation]	666670.4	7032559.7	205

What would you estimate the cost per hour is to your facility because of unplanned downtime? [Please answer in terms of U.S. Dollars. Use numbers only, no punctuation]

Field	Mean	Std Deviation	Count
What would you estimate the cost per hour is to your facility because of unplanned downtime? [Please answer in terms of U.S. Dollars. Use numbers only, no punctuation]	16022.7	78357.3	205

What events have caused unplanned downtime at your facility? [select all that apply]

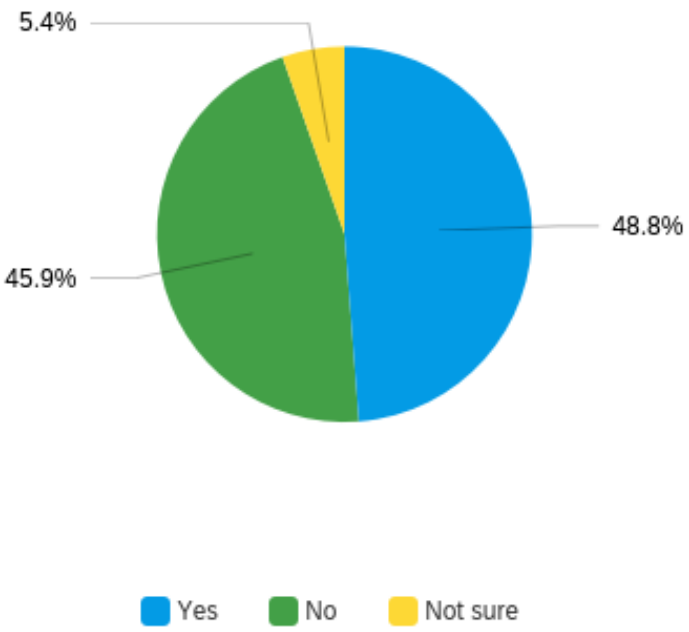


Answer	%	Count
Accidents	17.6%	91
Power surge	13.5%	70
Unavailable spare parts	10.4%	54
Poor shutdown planning	6.4%	33
Human error	20.8%	108
Poor criticality analysis	4.6%	24
Other (please describe)	2.1%	11
Unexpected resetting or mis-operation of equipment	13.1%	68
Unknown cause	11.4%	59
Total	100%	518

“Other” responses:

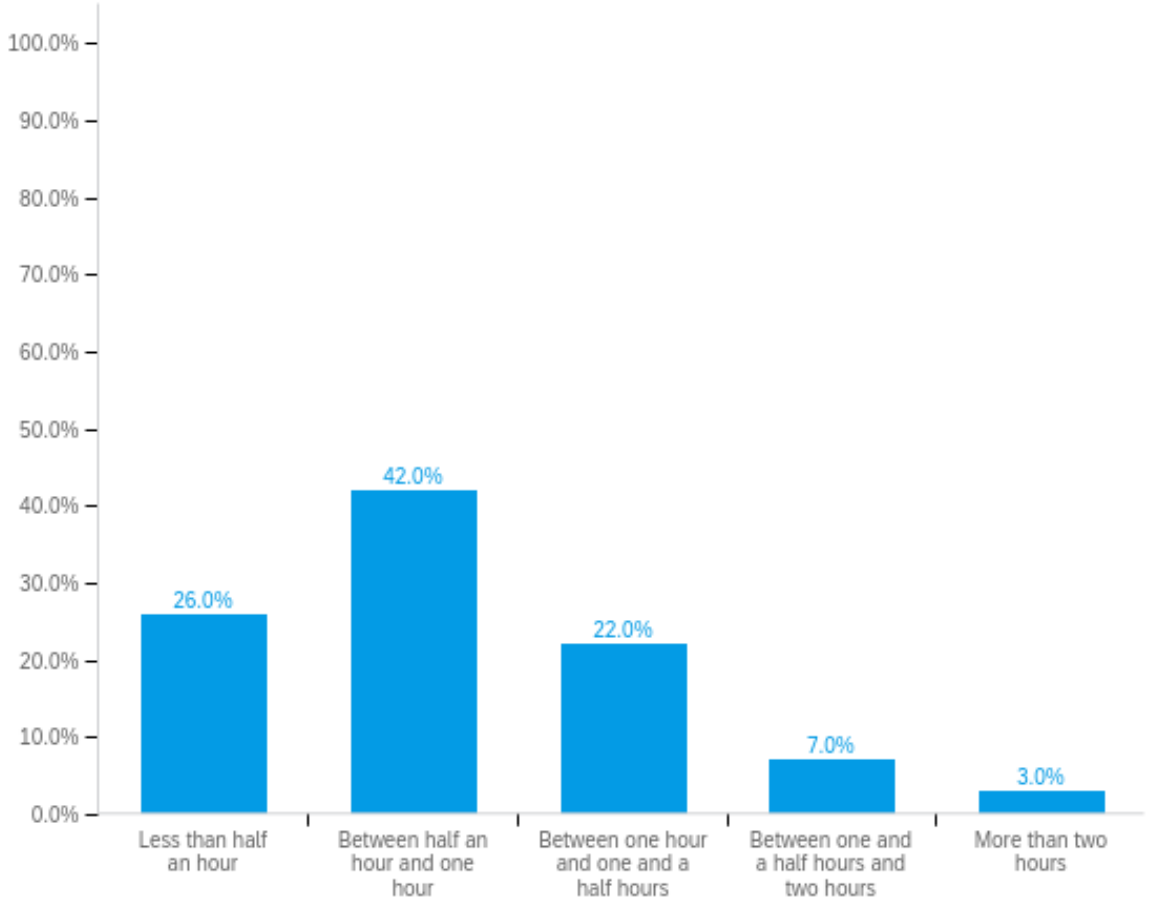
- power company
- Power shutdown
- hot weather
- natural disaster
- Weather (x3)
- Winter storm
- Grid
- The SCE faulty equip
- n/a

Within the last 12 months, has your facility experienced unplanned downtime caused by a power surge?



Answer	%	Count
Yes	48.8%	100
No	45.9%	94
Not sure	5.4%	11
Total	100%	205

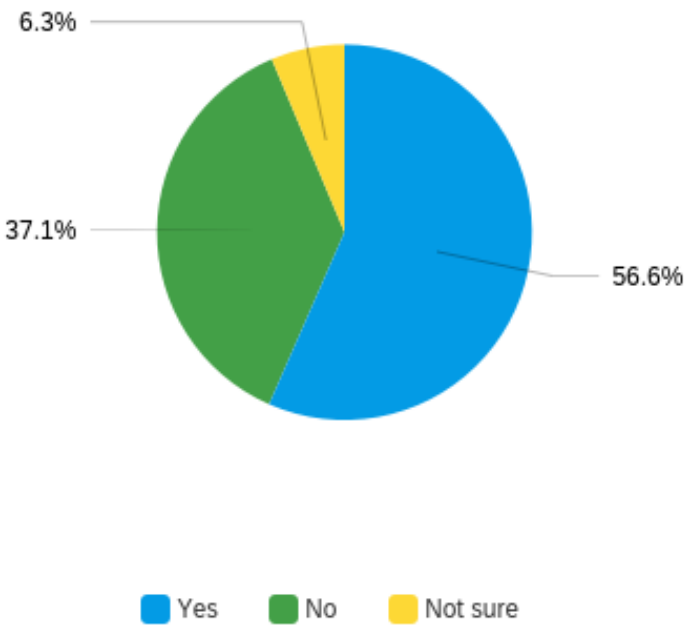
How long did the most recent downtime incident caused by a power surge at your facility last?



Field	Count	Bottom 2 Box	Top 2 Box
How long did the most recent downtime incident caused by a power surge at your facility last?	100	68.0%	10.0%

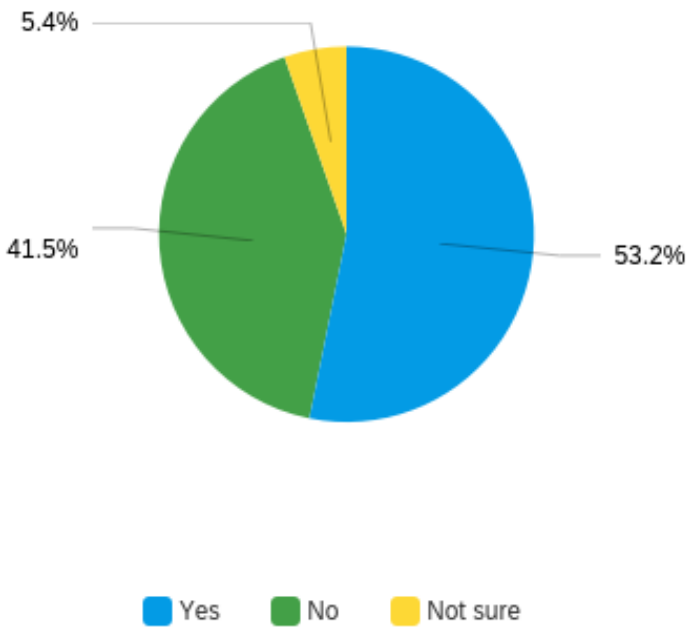
Answer	%	Count
Less than half an hour	26.0%	26
Between half an hour and one hour	42.0%	42
Between one hour and one and a half hours	22.0%	22
Between one and a half hours and two hours	7.0%	7
More than two hours	3.0%	3
Total	100%	100

Has your facility experienced a voltage surge that resulted in an equipment restart or mis-operation?



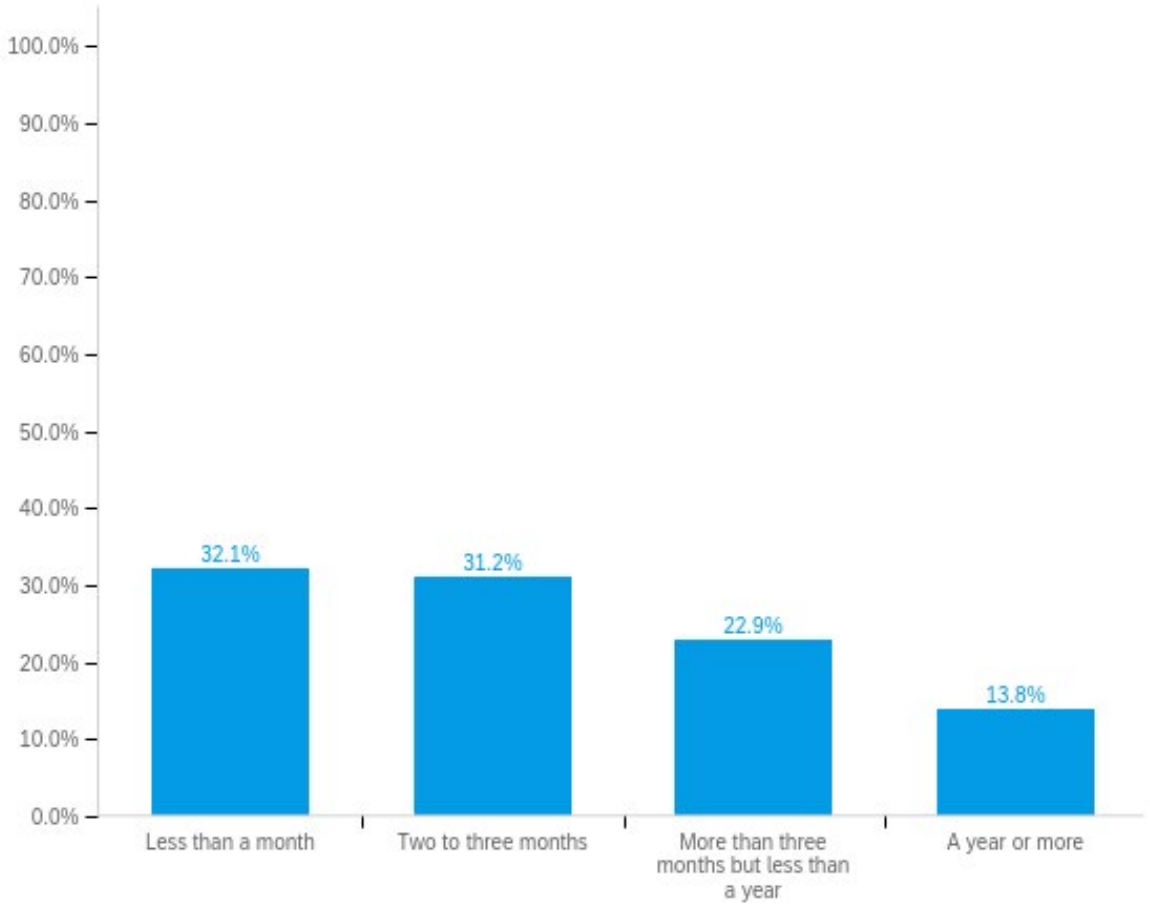
Answer	%	Count
Yes	56.6%	116
No	37.1%	76
Not sure	6.3%	13
Total	100%	205

Has your facility experienced a voltage surge that caused a power outage or equipment failure?



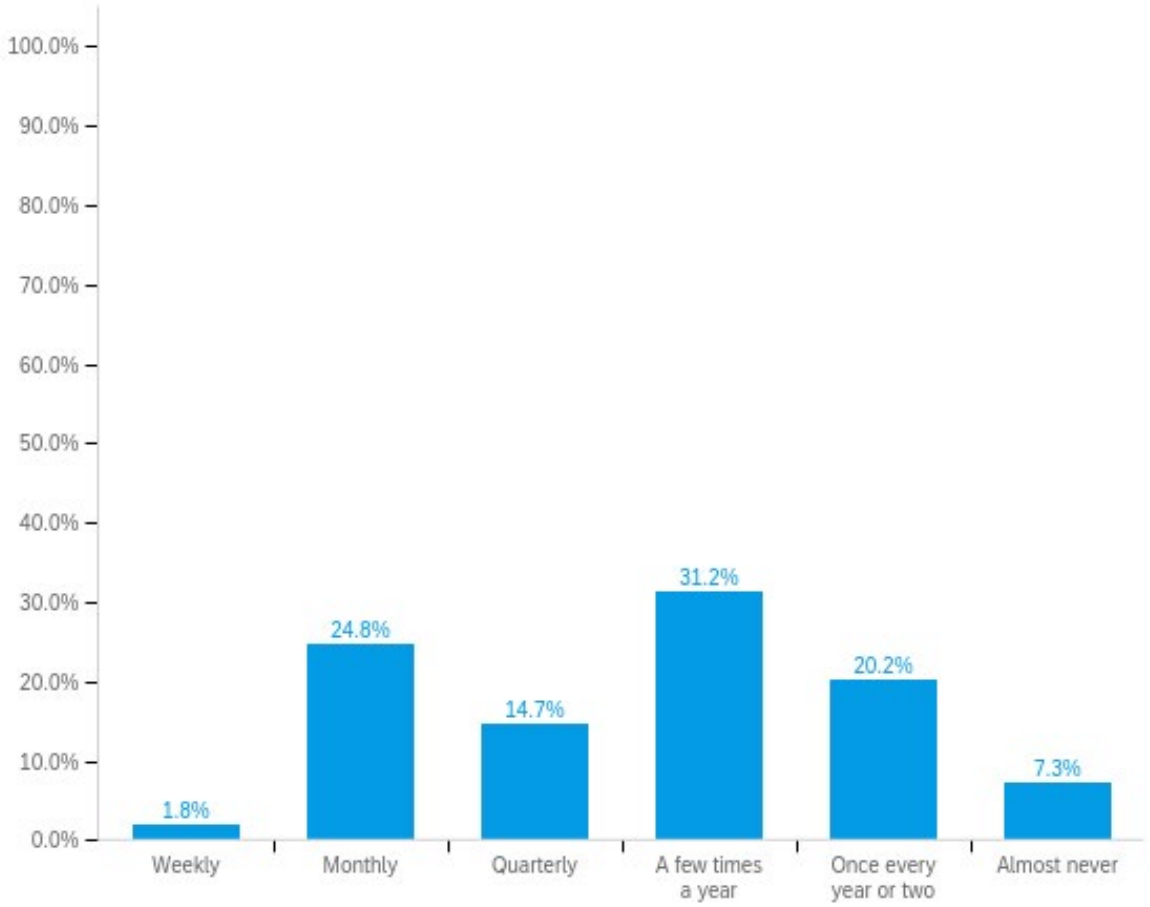
Answer	%	Count
Yes	53.2%	109
No	41.5%	85
Not sure	5.4%	11
Total	100%	205

How recently did your facility experience a voltage surge?



Answer	%	Count
Less than a month	32.1%	35
Two to three months	31.2%	34
More than three months but less than a year	22.9%	25
A year or more	13.8%	15
Total	100%	109

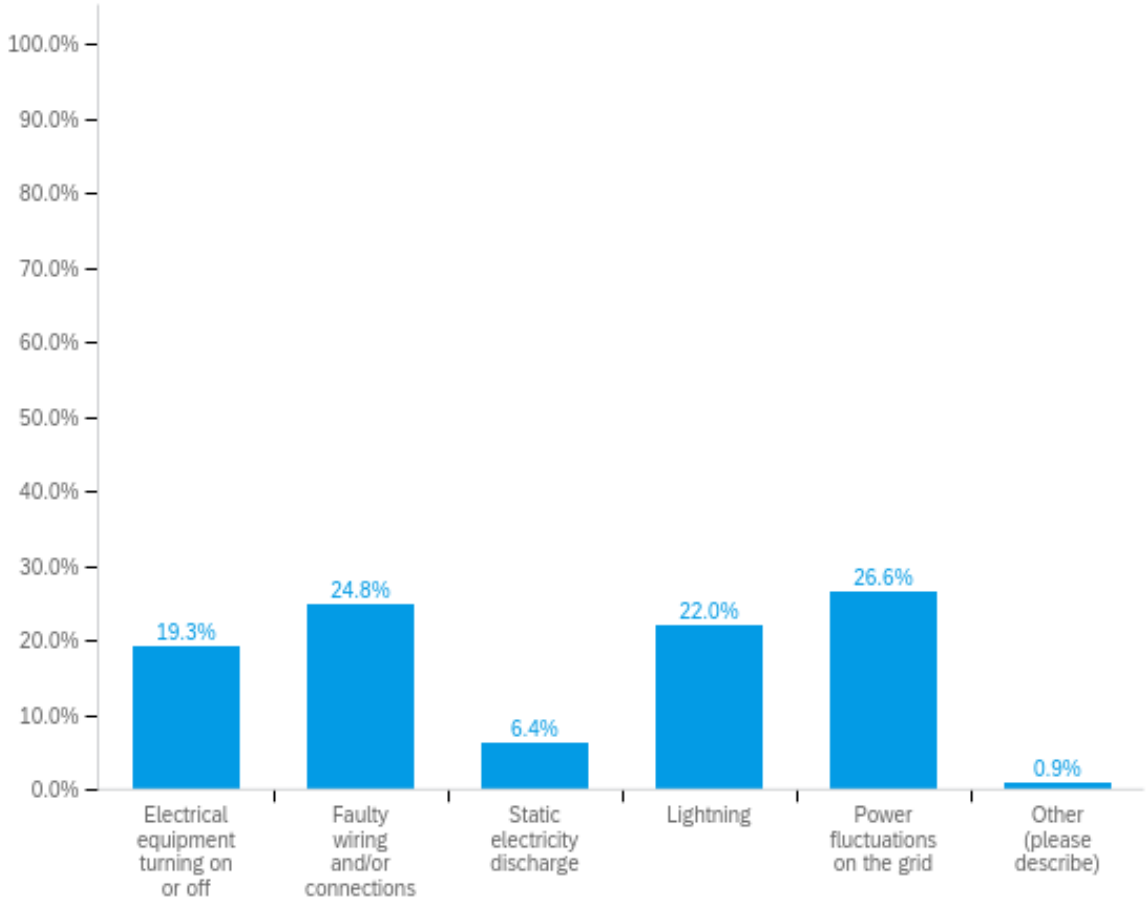
How often does your facility experience voltage surges?



Field	Count	Bottom 2 Box	Top 2 Box
How often does your facility experience voltage surges?	109	26.6%	27.5%

Answer	%	Count
Weekly	1.8%	2
Monthly	24.8%	27
Quarterly	14.7%	16
A few times a year	31.2%	34
Once every year or two	20.2%	22
Almost never	7.3%	8
Total	100%	109

What has been the most common cause of voltage surges within your facility?



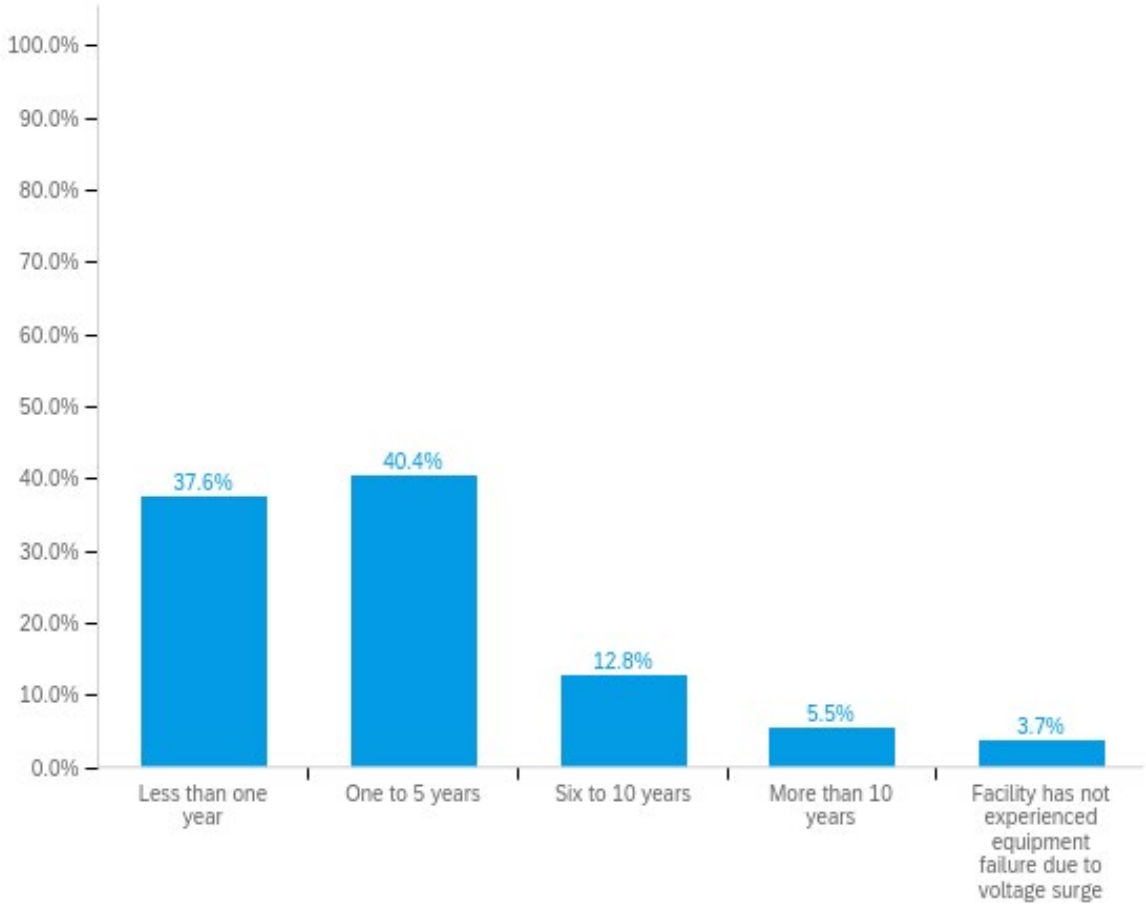
Answer	%	Count
Electrical equipment turning on or off	19.3%	21
Faulty wiring and/or connections	24.8%	27
Static electricity discharge	6.4%	7
Lightning	22.0%	24
Power fluctuations on the grid	26.6%	29
Other (please describe)	0.9%	1
Total	100%	109

Other (please describe) - Text
hot weather

Dragging the sliders below, estimate the percentage of voltage surges affecting your facility that have been caused by factors outside of your facility versus those that have been caused by factors inside your facility. [Note: total will automatically equal 100%]

Field	Mean	Count
Outside my facility	59.5	108
Inside my facility	40.5	108

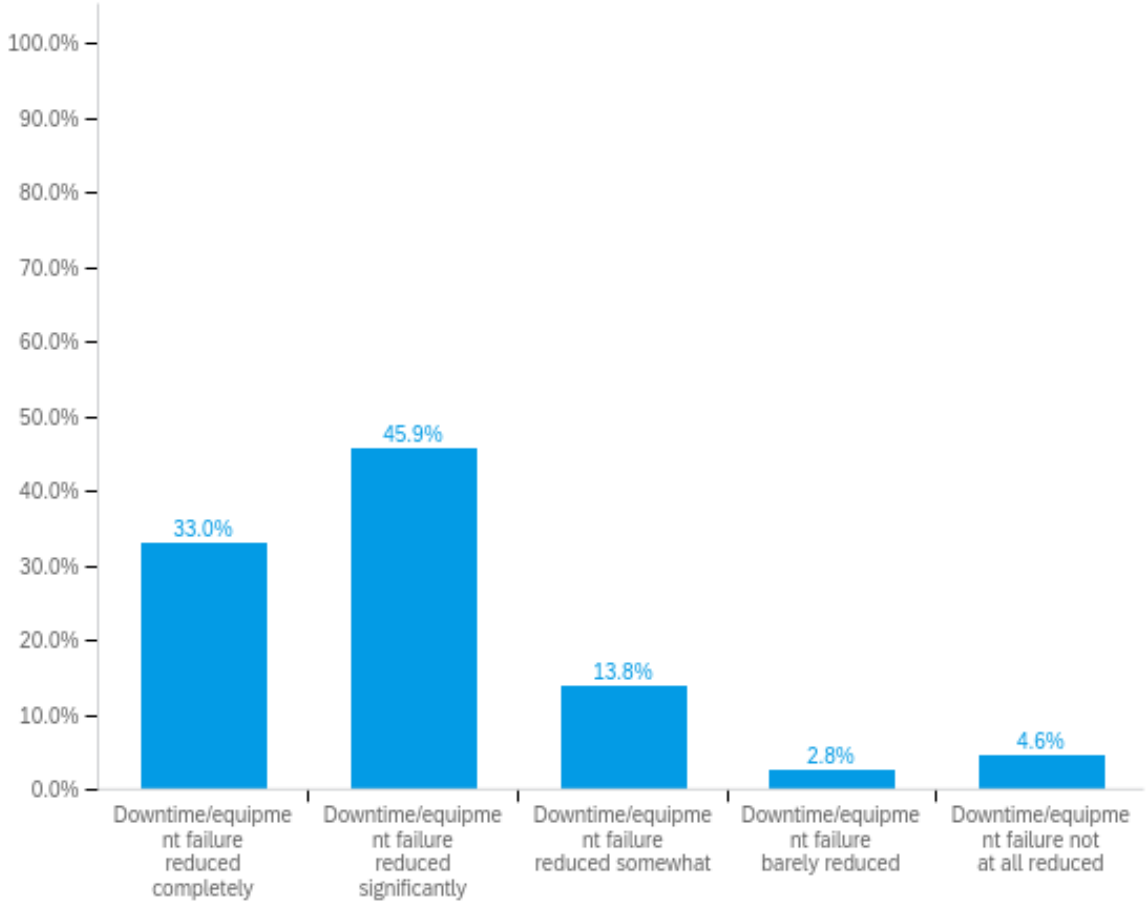
In the most recent case of equipment failure due to voltage surge at your facility, how long had the device that failed been in service?



Field	Count	Bottom 2 Box	Top 2 Box
In the most recent case of equipment failure due to voltage surge at your facility, how long had the device that failed been in service?	109	78.0%	9.2%

Answer	%	Count
Less than one year	37.6%	41
One to 5 years	40.4%	44
Six to 10 years	12.8%	14
More than 10 years	5.5%	6
Facility has not experienced equipment failure due to voltage surge	3.7%	4
Total	100%	109

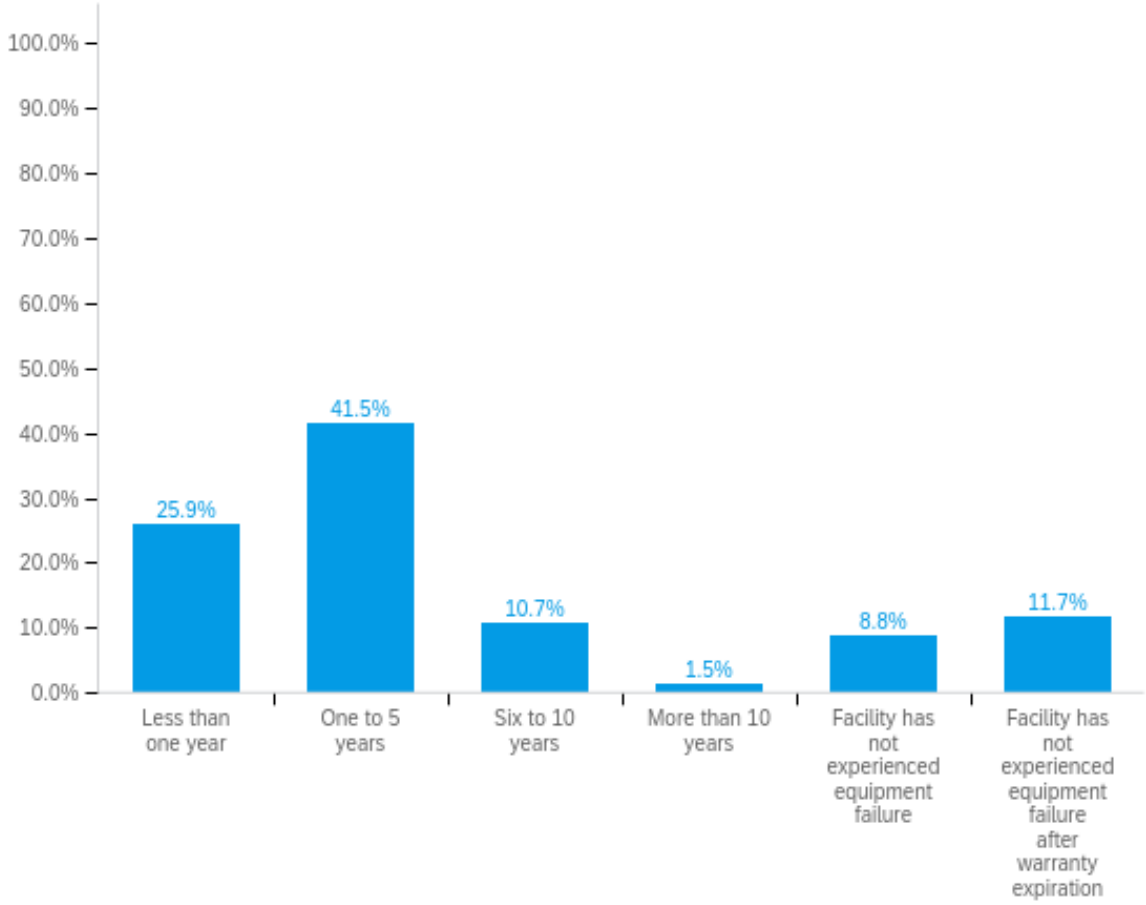
How much would you say the installation of surge protective devices has cut down on the amount of downtime/equipment failure at your facility?



Field	Count	Bottom 2 Box	Top 2 Box
How much would you say the installation of surge protective devices has cut down on the amount of downtime/equipment failure at your facility?	109	78.9%	7.3%

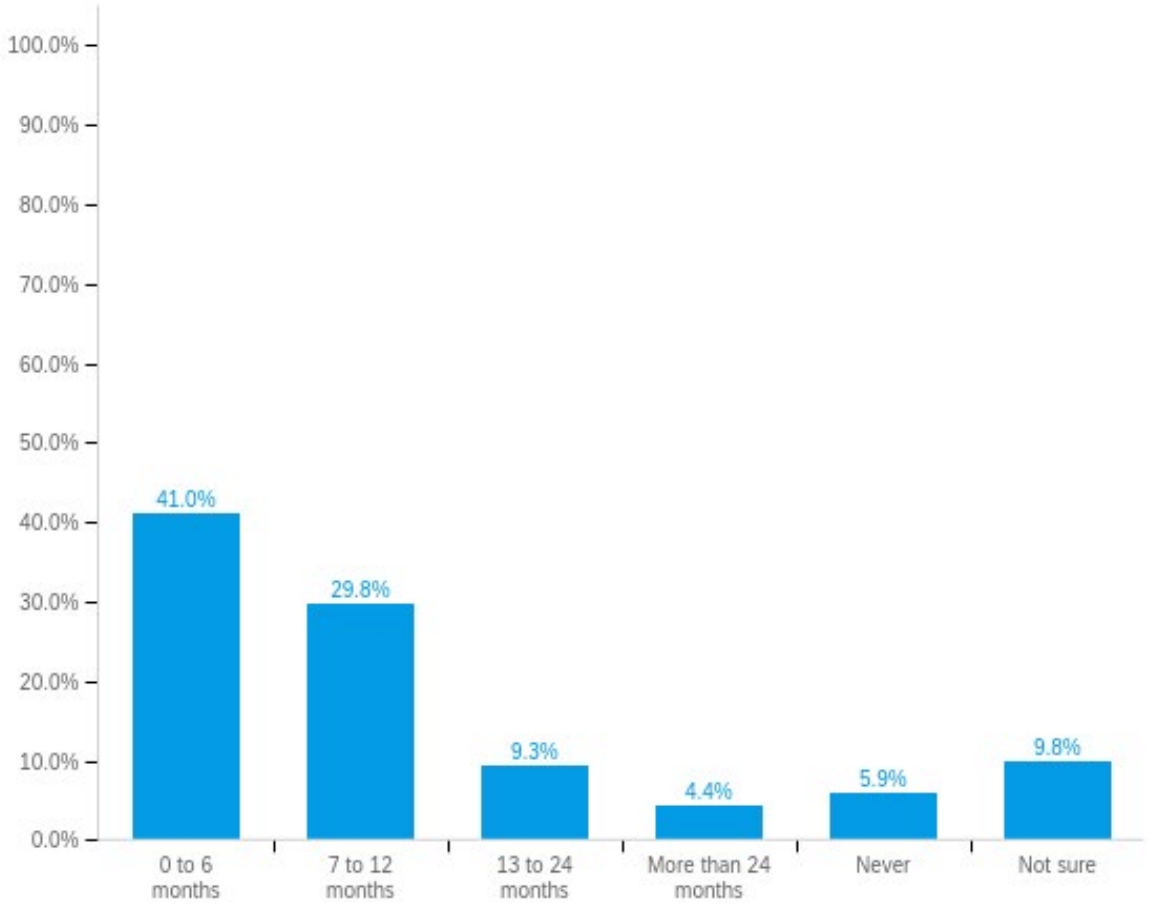
Answer	%	Count
Downtime/equipment failure reduced completely	33.0%	36
Downtime/equipment failure reduced significantly	45.9%	50
Downtime/equipment failure reduced somewhat	13.8%	15
Downtime/equipment failure barely reduced	2.8%	3
Downtime/equipment failure not at all reduced	4.6%	5
Total	100%	109

In the most recent case in which equipment failed at your facility -- for any reason -- how long after warranty expiration did the failure occur?



Answer	%	Count
Less than one year	25.9%	53
One to 5 years	41.5%	85
Six to 10 years	10.7%	22
More than 10 years	1.5%	3
Facility has not experienced equipment failure	8.8%	18
Facility has not experienced equipment failure after warranty expiration	11.7%	24
Total	100%	205

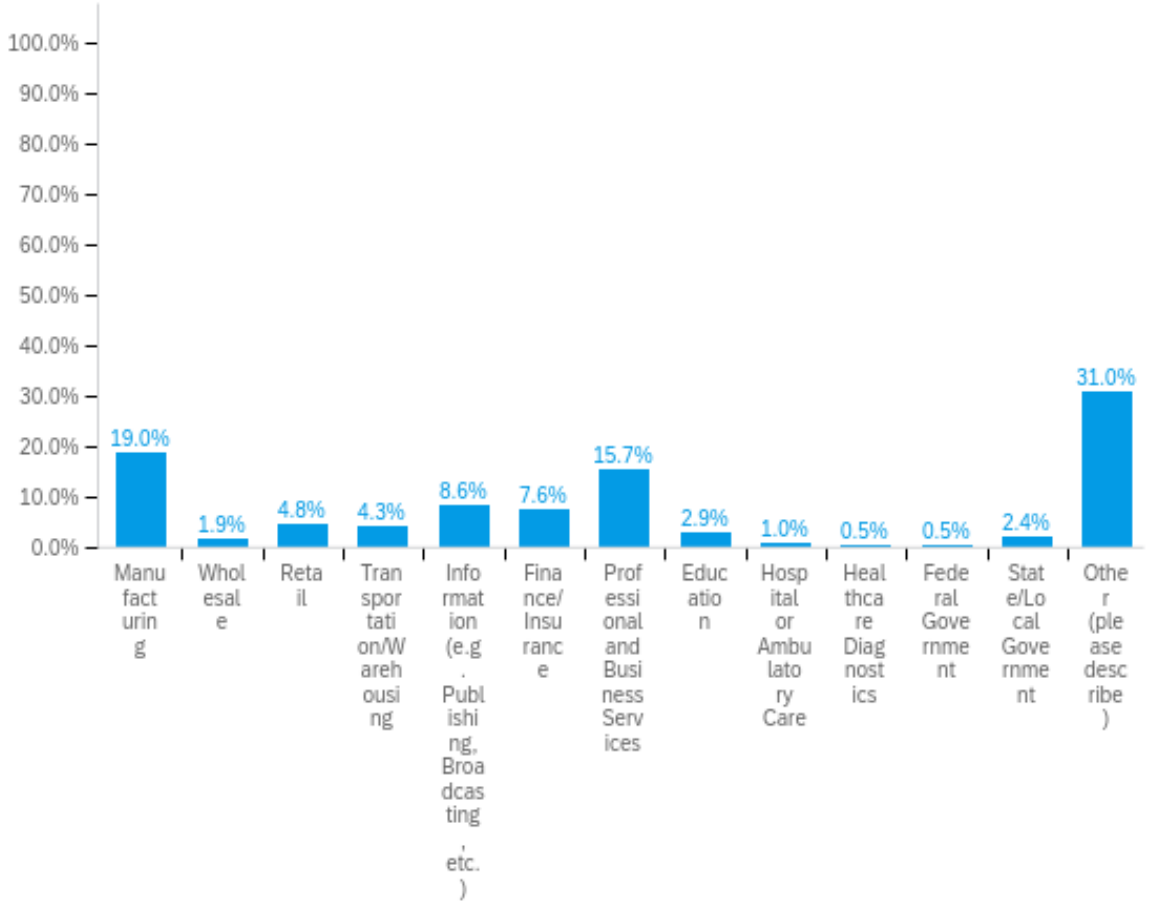
When was the last time you performed a resistance reading on your facility's grounding system?



Field	Count	Bottom 2 Box	Top 2 Box
When was the last time you performed a resistance reading on your facility's grounding system?	205	70.7%	15.6%

Answer	%	Count
0 to 6 months	41.0%	84
7 to 12 months	29.8%	61
13 to 24 months	9.3%	19
More than 24 months	4.4%	9
Never	5.9%	12
Not sure	9.8%	20
Total	100%	205

From the following list, please select the primary business function of the facilities you manage.



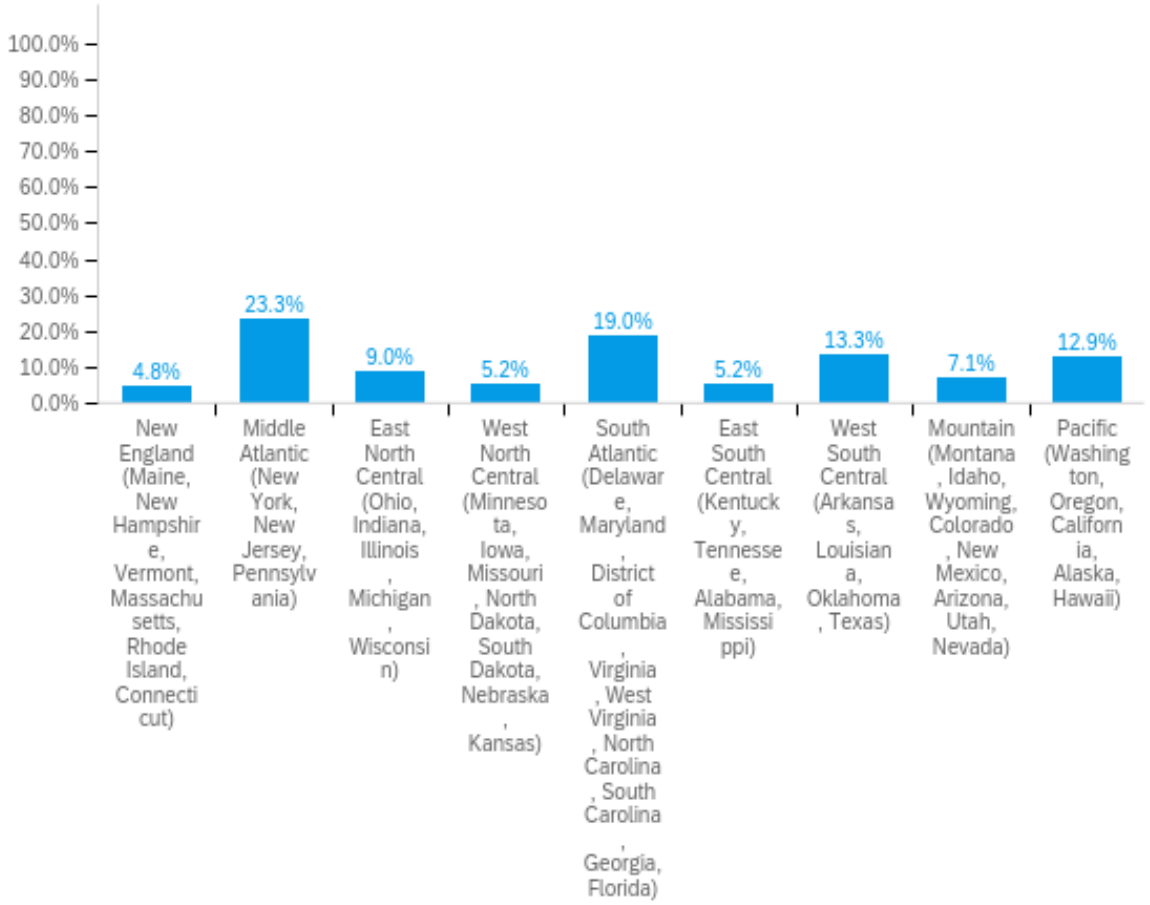
Answer	%	Count
Manufacturing	19.0%	40
Wholesale	1.9%	4
Retail	4.8%	10
Transportation/Warehousing	4.3%	9
Information (e.g. Publishing, Broadcasting, etc.)	8.6%	18
Finance/Insurance	7.6%	16
Professional and Business Services	15.7%	33
Education	2.9%	6
Hospital or Ambulatory Care	1.0%	2
Healthcare Diagnostics	0.5%	1
Physician Office	0.0%	0
Federal Government	0.5%	1
State/Local Government	2.4%	5
Other (please describe)	31.0%	65
Total	100%	210

Most frequently used "Other" responses:

What is the approximate total square footage of the facility or facilities you manage?

Field	Mean	Std Deviation	Count
What is the approximate total square footage of the facility or facilities you manage?	29316.9	121170.3	210

In what region of the United States are you located?



Answer	%	Count
New England (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut)	4.8%	10
Middle Atlantic (New York, New Jersey, Pennsylvania)	23.3%	49
East North Central (Ohio, Indiana, Illinois, Michigan, Wisconsin)	9.0%	19
West North Central (Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas)	5.2%	11
South Atlantic (Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida)	19.0%	40
East South Central (Kentucky, Tennessee, Alabama, Mississippi)	5.2%	11
West South Central (Arkansas, Louisiana, Oklahoma, Texas)	13.3%	28
Mountain (Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada)	7.1%	15
Pacific (Washington, Oregon, California, Alaska, Hawaii)	12.9%	27
Total	100%	210