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EPA Docket Center
U.S. Environmental Protection Agency
Mail Code: 2822T
1200 Pennsylvania Ave. NW.
Washington, DC 20460

Subject: Attention Docket ID No. EPA-HQ-OAR-2013-0602
Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units

Comment Topic: Removal of Under-Construction Nuclear from Emissions Performance Goal Computation

Dear Docket Coordinator:

The Georgia Environmental Protection Division (EPD) appreciates the opportunity to provide the following comments on the United States Environmental Protection Agency's (EPA) Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units also called the proposed Clean Power Plan (CPP) or 111(d). The proposal was published in the *Federal Register* on June 18, 2014 (79 Federal Register 34830).

Georgia EPD requests that EPA remove under-construction nuclear generation from the computation of BSER and state emissions goals. Supporting arguments for this request are presented below. The comments herein are intended to address only the treatment of under-construction nuclear facilities in EPA's proposal. These comments do not waive and are not intended to waive EPD's right, which it specifically reserves, to submit additional and/or alternative comments on this proposal.

The President has recognized and clearly intends for nuclear energy to play an important part in addressing climate change in the United States.

In 2012, nuclear power produced about 64% of the zero-carbon electricity in the United States according to the Nuclear Energy Institute.[1] President Obama, in his June 2013 Memorandum to EPA, recognized and clearly intended for nuclear energy to be a significant part of addressing climate change in the United States, because nuclear energy has the capability to supply reliable, affordable power with zero carbon emissions, stating that:

> "As a country, we can continue our progress in reducing power plant pollution, thereby improving public health and protecting the environment, while supplying the reliable, affordable power needed for economic growth and advancing cleaner energy

> technologies, such as efficient natural gas, **nuclear power**, renewables such as wind and solar energy, and clean coal technology."[2] [Emphasis added]

On June 25, 2013, in a speech on climate change, President Obama recognized the important role that under-construction nuclear will play in reducing carbon emissions, stating:

> "And thanks to the ingenuity of our businesses, we're starting to produce much more of our own energy. We're building the first nuclear power plants in more than three decades -- in Georgia and South Carolina. So we're producing energy. And these advances have grown our economy, they've created new jobs, they can't be shipped overseas -- and, by the way, they've also helped drive our carbon pollution to its lowest levels in nearly 20 years. Since 2006, no country on Earth has reduced its total carbon pollution by as much as the United States of America."[3]

Vogtle units 3 and 4, currently under construction in Georgia, will result in a significant expansion of zero-carbon generation capacity when completed. Vogtle units 3 and 4 are co-owned by Georgia Power, Oglethorpe Power, the Municipal Electric Authority of Georgia (MEAG) and Dalton Utilities. Georgia Power owns 45.7% of the new units under construction, while Oglethorpe owns 30%, MEAG owns 22.7%, and the municipal utility in Dalton, Georgia, owns 1.6%[6]. Tennessee and South Carolina also have new nuclear generating capacity under construction. The additional generating capacity from Vogtle units 3 and 4 will displace up to 2,250 MW of net electrical output from fossil fuel generation (either existing or future growth). EPA's proposed treatment of under-construction nuclear places a disproportionate burden on Georgia for moving forward with two of the first nuclear plants constructed in three decades by 1) including under-construction nuclear in Georgia's state goal, and by 2) requiring renewable energy and energy efficiency targets for Georgia equivalent to those in states that are not investing in nuclear generating capacity.

Georgia has adopted state policies to support development of new nuclear units. Construction of new nuclear generating units represents a significant financial investment with risk.

On Page 34858 of the proposal, EPA states that:

> "... Low-and zero-carbon generating capacity provides electricity that can be substituted for generation from more carbon-intensive [electric generating units] EGUs. More than half the states already have established some form of state-level renewable energy requirements, with targets calling on average for almost 20 percent of 2020 generation to be supplied from renewable sources. **The EPA is unaware of analogous state policies to support development of new nuclear units...**"

Georgia strongly disagrees with EPA's contention that there are no state policies to support development of new nuclear units. Georgia's State Energy Strategy, initially developed in 2006, states that:

> ***"Key Theme 1: Prioritize Energy Resource Development in the State*** – In order to meet Georgia's growing energy needs, Georgia should consider prioritizing the various energy resource options available to meet the state's growing energy demand. The Council recommends as its highest priority that Georgia should aggressively pursue all cost-effective energy efficiency opportunities. In order to focus this effort, the Governor should consider, after a thorough cost-benefit analysis and jointly with the General Assembly, an energy efficiency goal to significantly reduce the forecast load growth over the next 10 years. For purposes of scope only, other states have set goals from 20 to 30 percent. The second priority should be renewable energy resources, particularly utilization of Georgia's significant biomass resources. The third priority should be advanced conventional energy resources, such as advanced coal gasification and combined cycle technology and **advanced nuclear reactors.**"[Emphasis added]

and

> **"Strategy 1.2 – Evaluate State Risk Posed by Possible Federal Carbon Regulations**
> ... As carbon regulation proposals gain momentum on Capitol Hill, it behooves utilities and states to take stock of their current electricity generation and understand what life would look like in a "carbon constrained" world...
>
> GEFA, the Georgia PSC and the Environmental Protection Division (EPD) of Georgia should conduct a joint study of the potential impact of proposals to regulate carbon emissions on Georgia's utilities and ratepayers. This assessment should document the current carbon dioxide emissions from Georgia electric generating units, forecast future emissions from these facilities and evaluate the economic impact on Georgia from possible carbon regulations..."

The Georgia House and the Georgia Senate passed single-chamber resolutions in the 2006 legislative session supporting the development of new nuclear capacity (HR 1365 and SR 865).[4]

In 2009, the Georgia Public Service Commission approved the construction of two new nuclear generation units at Plant Vogtle in Waynesboro, Georgia.[5]

The estimated cost of Vogtle units 3 and 4 is **$14 billion**. This project would not be moving forward without state policies that support the development of new nuclear units.

The significant likelihood of future greenhouse gas regulations was also considered in the Georgia utilities' decision to add nuclear generation. For example, Georgia Power, in its January 31, 2007 Integrated Resource Plan submittal to the Georgia Public Service Commission, stated the following about its plans to construct Vogtle units 3 and 4:

> "The addition of nuclear generation would further diversify Georgia's generation mix, lessening our state's dependency on natural gas and coal, while providing an additional, environmentally sound fuel alternative... and ...
>
> - Nuclear accounts for nearly three-quarters of all emission-free electric generating capacity in the United States and is best positioned for future large-scale growth.
> - Nuclear energy emits no sulfur dioxide, nitrogen oxide, mercury or **carbon dioxide** ..."[7][Emphasis added]

Georgia made the choice to invest significant state resources in nuclear power (1) in reliance on state policies in favor of nuclear power as a clean, carbon-free source of energy, and (2) in expectation of future federal regulations of carbon emissions. But EPA's proposed treatment of under-construction nuclear places a disproportionate burden on Georgia, as well as South Carolina and Tennessee, for taking early action. Vogtle units 3 and 4 were proposed in 2008 after (now President) Barack Obama's 2008 campaign pledge to address climate change. At the same time, the American Clean Energy and Security Act (Waxman-Markey) was being debated in the United States Congress. While Georgia was moving forward with nuclear construction, the states that formed the Regional Greenhouse Gas Initiative (RGGI) in the Northeastern United States were completing state rule making processes for their regional cap-and-trade program. Simply stated, Vogtle units 3 and 4 are under construction now because Congress and the President clearly signaled in 2008 that regulations to reduce carbon emissions from fossil fuel-fired EGUs were imminent. The President also encouraged the development of new nuclear as a clean energy resource when the U.S. Department of Energy (DOE) awarded the Plant Vogtle project a $6.5 billion DOE loan guarantee in February 2014 in an effort to encourage the construction of these units. [8]

EPA's proposed rule gives Georgia citizens no credit for the $14 billion investment in Vogtle 3 and 4, and the subsequent operating costs, because the units were proposed and approved by the Nuclear Regulatory Commission (NRC) and Georgia Public Service Commission before the Clean Power Plan was proposed. From page 34870 of the proposal:

> "...The EPA believes that since the decisions to construct these units [Watts Bar 2 in Tennessee, Vogtle 3–4 in Georgia, and Summer 2–3 in South Carolina] were made prior to this proposal, it is reasonable to view the incremental cost associated with the CO2 emission reductions available from completion of these units as zero for purposes of setting states' CO2 reduction goals (although the EPA acknowledges that the planning for those units likely included consideration of the possibility of future regulation of CO2 emissions from EGUs). Completion of these units therefore represents an opportunity to reduce CO2 emissions from affected fossil fuel-fired EGUs at a very reasonable cost. **For this reason, we are proposing that the emission reductions achievable at affected sources based on the generation provided at the identified nuclear units currently under construction should be factored into the state goals for the respective states where these new units are located...**" [Emphasis added]

Georgia EPD strongly disagrees with EPA's assertion that the capital costs and incremental costs associated with CO2 emission reductions as a result of Vogtle units 3 and 4 are zero. Georgia Power's ratepayers began paying for this investment in nuclear energy in 2011 with an increase in their base bill to pay for the financing of this project. Georgia Power's Nuclear Construction Cost Recovery Schedule (NCCR) recovers the cost of financing associated with the construction of Vogtle units 3 and 4. The NCCR rider is currently **9.3141%**.[9] Once these plants are operational, the rate impact is projected to be **6-8%** of the base bill. The other utilities investing in Plant Vogtle are similarly passing on these costs to their ratepayers.

These actual costs undermine EPA's basic reason for including under-construction nuclear in the baseline calculations. These new units are not an inexpensive opportunity to reduce carbon emissions from existing fossil fuel units but are in fact quite costly. By including under-construction nuclear in Georgia's goal, but treating our significant investment in under-construction nuclear as "sunk costs," EPA's proposal forces Georgia to expend funds in addition to the billions invested in under-construction nuclear to meet the proposed goal. For this reason alone, under-construction nuclear should not be included in the calculation of the state goal.

EPA should not be sending a message to state policy makers and the regulated community that those taking risk with early action will be penalized. That may have not been the intent, however, the way under-construction nuclear is treated in the goal calculation has that effect. We see no reason that under-construction nuclear should be treated any differently than yet to be planned nuclear.

The proposed rule's treatment of under-construction nuclear eliminates state flexibility in achieving the goal and is not compatible with the other building blocks.

On Page 34870 of the proposal, EPA solicits comment on including under-construction nuclear in the state goals, stating:

> "...However, the EPA also realizes that reflecting completion of these units in the [state] goals has a significant impact on the calculated goals for the states in which these units are located. If one or more of the units were not completed as projected, that could have a significant impact on the state's ability to meet the goal. **We therefore take comment on whether it is appropriate to reflect completion of these units in the state goals** and on alternative ways of considering these units when setting state goals..."

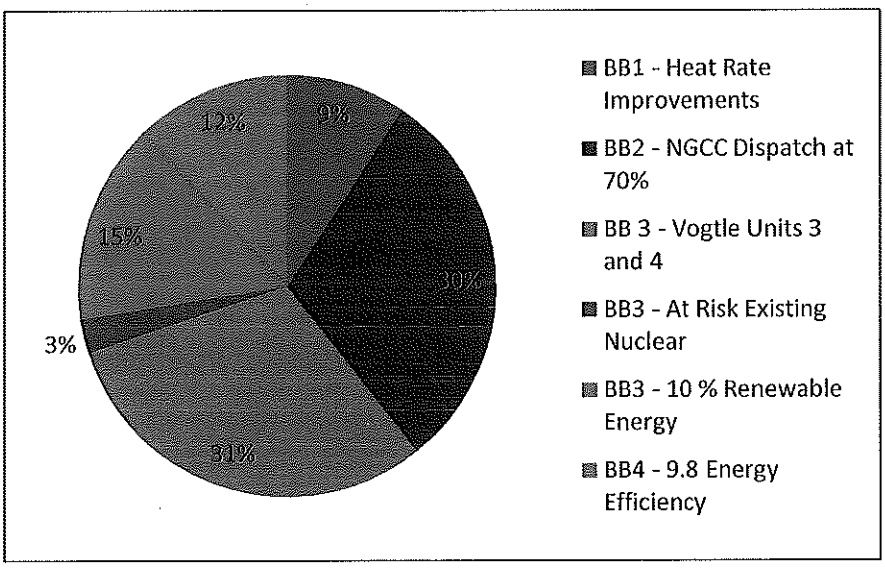
Georgia EPD believes that it is not appropriate to include under-construction nuclear in the state goals even though construction of Vogtle units 3 and 4 is well underway and likely to continue despite the challenges of being the first nuclear plants constructed in the United States in over three decades. The current estimated commercial operation dates for Vogtle units 3 and 4 are the fourth quarters of 2017 and 2018, respectively. Of course, additional construction delays and cost overruns are possible. For example, after the 2011 earthquake damaged the Fukushima Daiichi nuclear generating units in Japan, the NRC issued a series of safety-related change orders to US nuclear facilities.[10] The cost of the changes

is significant. In addition, these changes can affect the overall project schedule. Other changes such as these could further impact the cost and schedule of these projects.

While it is certainly likely that Vogtle units 3 and 4 will ultimately start-up and generate power at or near their rated capacity, the units would not be operational for several more years even in a best-case scenario. The Vogtle units also represent advanced nuclear technology[11] which creates a certain degree of uncertainty regarding the time to ramp up to expected performance as well as on-going reliable operation. Therefore reflecting the completion of Vogtle units 3 and 4 in a proposed state goal is simply not appropriate.

In addition, the way nuclear generation ultimately impacts the goal and achievement of the goal is **fundamentally different** than the other building blocks. If any of the renewable energy, energy efficiency, or heat rate improvements efforts fall short, it is possible to compensate by overachieving in one of the other areas. The under-construction nuclear generation has such a significant impact on the goal that any shortfall in ultimate performance would be virtually impossible to overcome (see Chart 1 below). The way under-construction nuclear is treated in the proposed rule essentially eliminates any "headroom" Georgia has in meeting either the interim or the 2030 goals.

Chart 1 – Breakdown of Georgia's 2030 Goal Computation (as Proposed by EPA)
Percentage Rate Change from Each of EPA's Building Blocks
(1598 lbs CO2/MWh in 2012 to 834 lbs CO2/MWh in 2030)



The building blocks for heat rate improvement, natural gas dispatch, renewable energy and energy efficiency were all derived from practices or policies already in place in other sectors or states. Given that under-construction nuclear only exists in three states, there is no benchmark to reference or use as

a basis for how to treat under-construction nuclear. The other building blocks are also expressed as a percentage along a continuum (e.g. 9.8 % of sales from energy efficiency). Nuclear plants are not designed to be ramped up and down. The capacity is either there and fully utilized or not there at all (i.e. not built or shut down due to planned maintenance outages or other unplanned outages). Any shortfall in generation during periods of outages could severely impact Georgia's ability to meet the emissions goal. Therefore, under-construction nuclear is a unique entity within the building blocks and fundamentally different than the other components used to calculate the goal. It does not logically fit into the methodology for calculating state goals and should be deleted from this calculation.

In 40 CFR 60.5820, EPA proposes a definition for affected entity as "...*Affected Entity* shall mean any of the following: An affected EGU, or another entity with obligations under this subpart for the purpose of meeting the emissions performance goal requirements in these emission guidelines..." Assuming but not conceding that this definition is consistent with the Clean Air Act and the regulations promulgated pursuant thereto, EPA should allow states to include under-construction nuclear and new nuclear, along with solar, wind and other zero-carbon or low-carbon generation, in the definition of affected entity for the purposes of demonstrating compliance in a state plan.

Nuclear power plants provide zero-emissions base load power.

On Page 2-3 of EPA's Regulatory Impact Analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants, EPA states:

> "Coal-fired generating units have historically supplied "base-load" electricity, the portion of electricity loads which are continually present, and typically operate throughout the day. Along with nuclear generation, these coal units meet the part of demand that is relatively constant..." [12]
>
> and
>
> ...Gas-fired generation is better able to vary output and is the primary option used to meet the variable portion of the electricity load and has historically supplied "peak" and "intermediate" power, when there is increased demand for electricity (for example, when businesses operate throughout the day or when people return home from work and run appliances and heating/air-conditioning), versus late at night or very early in the morning, when demand for electricity is reduced...[12]

Vogtle units 3 and 4 will provide zero-carbon emitting base load power of 2,250 MW when completed that will likely displace some of Georgia's current or future fossil-fuel based generation needs. The U.S. Energy Information Administration states that nuclear power plants are generally used more intensively than coal or natural gas units. In 2012, the nuclear share of electricity generating capacity was 10%, while nuclear's share of national power output was 19%.[13]

Solar and wind power cannot be relied upon for base load power. Solar is the primary renewable energy generating source currently available in Georgia, with about 800 MW of solar generation either operating or announced in Georgia. Peak solar generation occurs around noon or early afternoon on sunny days. The peak load demand in Georgia occurs in the summertime between 4 PM and 7 PM. Solar generating capacity is very limited during peak load demand hours. Therefore solar will displace fossil fuel generation when it is available but other zero carbon generating capacity is needed at all times, including during periods of peak demand, to provide overall grid reliability. Nuclear generation is needed to ensure reliable power and is the cleanest energy source that can satisfy base load demand.

Georgia has an ambitious reduction goal even without under-construction nuclear complications.

If under-construction nuclear is removed from Georgia's goal computations, the 2030 goal rises to 967 lbs/MWh. This emission rate represents a 40% reduction from the 2012 baseline emissions rate, compared to a generation-weighted average of 36 % reduction for the six Southeastern states without under-construction nuclear (AL, FL, NC, MS, VA, KY). Even with removal of the under-construction nuclear from Georgia's goal computation, our state will be making significantly more reduction in carbon emissions than the six states without under-construction nuclear investment.

The computation of Georgia's business-as-usual rate (BAU) for 2020 is 1170 lbs CO2/MWh. BAU assumes that the under-construction nuclear is online and includes announced renewable energy and energy efficiency programs and projects. Clearly, Georgia would still need significant reductions from the other building blocks to reach the adjusted goal of 967 lbs CO2/MWh.

Including under-construction nuclear units in the Best System of Emission Reduction (BSER) determination places a disproportionate burden on the citizens of Georgia.

Georgia is being asked to accept a disproportionate burden under the proposed state goal. Whatever mix of carbon pollution reduction measures are utilized, our ratepayers specifically and the State's economy in general, will bear the cost. This regulation, as proposed could disproportionately raise Georgia's electricity costs versus neighboring states. Table 1, below, illustrates our concern. The current cost of electricity in Georgia is already slightly higher than a neighboring state. However, Georgia's proposed goal in the Clean Power Plan is significantly more stringent than the neighboring state. The investment needed in Georgia to achieve the more stringent goal could cause the price of electricity in Georgia to increase and widen that gap. The resulting higher electricity cost could hurt Georgia's competitive position for future economic development.

North Carolina has no under-construction nuclear. It does, however, have a renewable portfolio standard, which was used to set the renewable energy goal for the Southeastern States, including Georgia. So, EPA's proposal requires Georgia to construct and operate 2200 MW of nuclear capacity and add renewable energy generation comparable to North Carolina's renewable portfolio standard.

Table 1 – Electricity Cost Comparison

State	Average Cost, (cents per kWh) 2011	Average Cost, (cents per kWh) 2012	2012 Baseline - proposed CPP (lbs CO2/MWh)	2020 Interim Goal - proposed CPP (lbs CO2/MWh)	2030 Goal - proposed CPP (lbs CO2/MWh)
Alabama	9.10[14]	9.18[14]	1518	1147	1059
Georgia	9.61[15]	9.37[15]	1598	891	834

Four states are already exceeding their renewable energy goals, and EPA has chosen not to adjust their goals. However, for the three states (Georgia, South Carolina and Tennessee) moving forward with under-construction nuclear, their renewable energy goals were adjusted.

Forcing additional renewable energy generation into the state, in addition to the under construction nuclear with this proposed regulation, will likely result in stranded assets of coal units with significant remaining useful lives. The capital cost for nuclear is much higher than that of other generating technologies. Vogtle units 3 and 4 are a long-term investment to satisfy Georgia's future energy needs and to reduce the need for future carbon-emitting generation. Approximately 3 GW of Georgia coal generation capacity has retired or will be retiring by 2016, or has been or will be converted to natural gas by 2016. Georgia's utilities have invested in air pollution controls for the remaining coal units to comply with Georgia's Multipollutant Rule (sss), MATs, and CAIR/CSAPR. The accompanying reductions in SO_2, NO_X, and mercury have resulted in significant improvements in air quality for ozone, PM2.5, and regional haze. As part of these projects, the utilities have also invested in heat rate efficiency projects at the remaining coal units to make them as efficient as possible for their remaining useful life. If the utilities have to retire more of these units early to achieve carbon emission goals, electrical rates will nonetheless be adversely impacted as the capital cost recovery for these pollution control projects is incorporated into the rate structure in Georgia.

Removing under-construction nuclear from EPA's Best System of Emission Reduction (BSER) determination is consistent with EPA's exclusion of Partial Carbon Capture in BSER

For three states, Georgia, South Carolina and Tennessee, EPA's proposed BSER methodology includes under-construction nuclear. In the proposed Rule, EPA states that building new nuclear units [p. 34870 of the proposal] and Partial Carbon Capture and Storage (CCS) [p. 34876 of the proposal] are not economically feasible as BSER. However, the language in the proposal for under-construction nuclear and under-construction partial CCS are in conflict. There are five nuclear EGU's currently under construction in three states: Georgia, South Carolina, and Tennessee [p. 34870 of the proposal]. EPA has included these under-construction nuclear units in setting the goals for the state in which they are being built and sets the incremental costs of completing these facilities at zero. Similarly, the proposed Standards of Performance for Greenhouse Gas Emissions From New Stationary Sources: Electric Utility Generating Units; proposed rule lists two coal-fired CCS facilities that "have reached the advanced stages of construction and development" (Southern Company's Kemper County Energy Facility in

Mississippi and SaskPower's Boundary Dam Project in Saskatchewan) and two others that "continue to move forward" (Summit Powers Texas Clean Energy Project in Texas and Hydrogen Energy California Project) [79 FR 1434]. However, EPA did not include any of these coal-fired CCS facilities in setting the state goals for Mississippi, Texas, or California (the fourth CCS project is in Canada). The proposed 111(d) rule should be revised to exclude the CO2 emissions reduction associated with the five under-construction nuclear units from the state goals for Georgia, South Carolina, and Tennessee as it has excluded under construction coal-fired CCS units in setting the state goals for Mississippi, Texas, and California.

Conclusion

Vogtle units 3 and 4 are a long-term investment to satisfy Georgia's future energy needs and to reduce the need for future carbon-emitting generation. Vogtle units 3 and 4 have the potential to decrease carbon emissions from electricity generation in Georgia by up to 20 million tons annually, assuming 100% displacement of coal generation. The amount of nuclear generation capacity in Georgia will increase to 14% of total generating capacity, providing critical zero-carbon emitting base load power. This reduction in carbon emissions comes at a significant investment ultimately paid for by the ratepayers of Georgia.

In its proposal, EPA included renewable energy and energy efficiency targets in the goals for all states subject to the proposal. Unlike the renewable energy and energy efficiency targets, EPA's proposal includes under-construction nuclear in the goals of only three states: Georgia, South Carolina and Tennessee. EPA's proposed treatment of under-construction nuclear in these three states fails, among other things, to consider the burden it has unfairly and unequally imposed upon Georgia, South Carolina and Tennessee. Georgia urges EPA to remove under-construction nuclear from the BSER determination for these three states. All states should retain the option of including under-construction nuclear, new nuclear, solar, wind, and other zero-carbon emitting generation in the compliance demonstration for their state plans.

This change to the proposed rule would treat under-construction nuclear power generation sources consistently with other zero-carbon power sources, provide a more equitable treatment of the states committed to these nuclear projects, and recognize both the significant investment and significant reduction of carbon emissions resulting from these projects.

For the reasons stated herein, Georgia EPD requests that EPA remove under-construction nuclear generation from the computation of BSER and state emissions goals. Furthermore, EPA should retain under-construction nuclear in the definition of affected entity for the purposes of demonstrating compliance in a state plan.

Thank you for the opportunity to provide input on this important issue. Please contact me at 404-363-7016 or keith.bentley@dnr.state.ga.us if you have any questions or wish to discuss these comments.

Sincerely,

Keith Bentley

Keith Bentley
Chief, Air Protection Branch
Georgia Environmental Protection Division

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